JUL 16

VOLUME 4 (Old Series, Vol. VIII) JULY, 1930 NUMBER 1

ANNALS OF INTERNAL MEDICINE

PUBLISHED BY

The American College of Physicians

CONTENTS

	PAGE
Address of Welcome. S. H. Boyer	1
Presidential Address. J. H. Musser	5
Colloids in Medicine. Ross Aiken Gortner	14
Cerebral Localization. Lewis J. Pollock	21
The Psychological Panel. Walter Freeman	29
Gastro-Intestinal Troubles That Now Go Undiagnosed. Walter C. Alvarez	39
Arteriosclerosis in Diabetes. Elliott P. Joslin	54
Unrecognized Hyperthyroidism Masked as Heart Disease. Samuel A. Levine	67
Lead Poisoning in the English Books of Trades. Carl Vernon Weller	81
Editorials	94
Abstracts	99
Reviews	103
College News Notes	106

Issued Monthly

Ann Arbor, Michigan

Published by Hoeber

THE CHEST

ROENTGENOLOGICALLY CONSIDERED

BY

LeROY SANTE, M.D., F.A.C.P., F.A.C.R.

Professor of Radiology and Director of Department, St. Louis University Medical School; Radiologist to the University Group of Hospitals, St. Mary's Hospital and Infirmary; Chief City Radiologist to St. Louis City Hospitals; Consultant Radiologist to Koch Hospital for Tuberculosis, St. Louis Training School, etc.

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878

Address of Welcome*

By S. H. Boyer, *President of the Minnesota State Medical Association, Duluth, Minn.*

ORIGINALLY, physicians banded themselves together in order to keep their knowledge intact and their calling sacred, as witness the ancient guilds and the Oath of Hippocrates. So strong were these purposes that they have held through the centuries. Even today, though not always remembered, these purposes continue to be the chief motives that bind us together. Throughout antiquity, on through the dark ages and right down to the present time the medical profession has felt the influence of this tradition, and it has fettered us and made us feel almost as a thing apart from the social fabric in which we live and move and render service. So it is that in our changed world we have had difficulty in freeing ourselves from the bonds of habit, difficulty in extending and broadening our field of activities, difficulty in allying ourselves with and taking the lead in the various lay health activities of our time.

The increase in population, the congestion of the people in cities, the advent of the machine age and mass production, the changed economic conditions, the tremendous complexities of modern social and industrial life have resulted in all manner of blocs and groups, whose chief aims are to study their relations to the body politic to the end that they may intelligently battle for their continued existence. The medical profession no less than other groups, and perhaps even more than others, must struggle to maintain its independence. The main body of our profession recognized this fact some time ago, therefore in their general organizations began to escape beyond the confines of tradition, to recognize conditions as they confront us, and prepare to meet them on a practical basis. To this end they added to their scientific organization what might be called a social science division. This is made up of many special committees, unheard of in the time of our fathers, whose work is to study all those phases of modern life with which we have been out of touch and to point out to us our relationship to those phases so that we may properly adjust ourselves to them, carry our share of the social load and maintain our identity as an individual, independent and progressive group.

This panoramic change in the social order based upon the rapid acquisition of new and vast knowledge, new machines and new methods, extends into the field of medicine, in which field new facts, new knowledge, new practices have increased by leaps and

*Delivered at the Minneapolis Meeting of the American College of Physicians, February 10, 1930.

bounds beyond anything of which we had ever dreamed. Small wonder then that men began to give special attention to one or another of the multitudinous subjects in the practice of medicine. There was presently to emerge from this intensive study the so-called specialist, more properly termed in most instances one with a limited field of practice. Indeed in most cases the specialist's knowledge outside of his chosen field gradually vanished from his memory, while the field itself steadily contracted until almost any really capable man outside the limited field could not fail to see that the one within knew and practiced only a few stunts or tricks. Happily however all were not like that. There were those who knew the need of a broad foundation of knowledge and aimed through their contacts to keep their foundations in repair the while they built special structures upon them. It was the men of this type who sought each other out and banded together into special societies "to keep their knowledge intact" and to add more to it, even as you who are here today have done.

With the passage of time many new specialties developed with their corresponding societies, all of them exclusive, all of them confining their activities to the scientific phase only of professional life. Whereas the official general societies prepared to exercise an active influence in the various social, economic, industrial and other movements having an important relation to the position of the medical profession in the body politic, the special societies appear to have moved in the opposite direction. Two thoughts present themselves in regard to all of these special organizations. One pertains to the effect they may have upon the parent body; the other to the desirability of holding aloof from the extra-scientific activities of the general societies.

That the organization of an additional society whose scientific purposes are identical with those of one or more existent societies would, on the face of it, appear to be a division of interest and of strength cannot be denied. Whether or not such is the fact will depend upon several factors. If all the officers of the new society yield an equal interest to the activities of both societies and spend an equal amount of time in the service of both, providing of course that the time and interest given are not less then than before the new body was thought of, then the one has not weakened the other. But as it is only human to favor one's child it is reasonable to suppose that the above provisos will not obtain. In that case the result will be a division of strength and of interest with more or less injury to the original society. Should the new organization now fail to develop increasing strength in membership, attendance and production of scientific material there will be two weak societies instead of one strong one. Should the original body become so large as to become unwieldly, become so rich in accomplished members that comparatively few would ever have a chance to present worth-while papers, then it would be logical to suppose that the cause of scientific medicine would be

subserved by the birth of a new organization. We trust the latter conditions rule in the present instance.

We turn now, and with equal brevity, to the phase of extra-scientific activities. Whereas the general societies, fully alive to the rapid and evolutionary changes transpiring in the social, economic and industrial world, have found it expedient to devote a considerable part of their thought and action to extra-scientific work, the special societies hold aloof from this field. They seem to have deliberately, studiously aimed to avoid such duties. It is almost as though the age old habit of exclusiveness, acting like an hereditary influence vice-like in its grasp, had caused them to revert to type. This is probably as it should be, barring certain reservations, for if all of the special bodies should become active in this outside or extra-scientific work there would be no end to confusion and we would indeed be a profession divided against itself. On the other hand if these special societies do not manifest an interest in such work they then very definitely reduce the influence of the national organization, because the public soon learns to know that a large part of our profession is organically indifferent to some of our most vital problems and comes to look upon us as a great body of presumably intelligent men, who are in reality so stupid that they neither know their common economic needs nor have sense enough to learn what these needs are and then to proceed with a solid front to secure them.

Clearly then the special society, even though a source of scientific advantage to its members, becomes a source of weakness to the profession as a whole and will so continue unless the defect can be corrected in some way. The problems of the profession are no longer wholly scientific and the special societies should recognize this fact. Proper organization should establish points of contact with the parent society on the one hand and with all of the special societies on the other. Providing these bodies endorse the parent body in its various activities the latter will speak with a voice of authority that will command respectful attention.

The Minnesota State Medical Society is wise in organization and is known far and wide as being one of the strongest and best organized medical bodies in all the states. Being so recognized its official welcoming spokesman has had the temerity to suggest to you a closer relationship between all medical bodies, a federation if you please, believing that this can be realized and greatly to the advantage of all concerned.

Minnesota suggests that her splendid organic work serve as an example to be emulated; suggests and hopes that you strengthen your organization and grow strong and powerful in the cause of medicine.

The members of the Minnesota State Medical Society welcome you to our fair state. They know that mentally you will be gorged to bursting. They trust the joys of the banquet

table will lighten the burdens of the days.

Again they welcome you and in the words of Jahweh as heard by the prophet Ezekiel, who envisioned himself as standing in a vast Babylonian plain "full of bones - - - and they were very dry,"—

"Lo, within you I shall put spirit,
And ye shall live.
I shall grant you sinews,
I shall raise up for you flesh.
I shall set over you skin.
Within you I shall put spirit,
And ye shall live."

Presidential Address American College of Physicians*

J. H. Musser, M.D., *New Orleans, La.*

EVERY year, as a result of custom and, by now, well established precedent, your retiring president appears before you and, in the annual address, presents to you the report of the activities of our organization, the American College of Physicians, during the interval that has elapsed between the yearly meetings; he is wont to comment on the events that take place during the yearly meeting; he very generally has suggestions to make for the betterment of the organization, and he comments upon the policies that guide it. This year the duty of addressing you falls on my shoulders. Perchance one is quite aware that when the word duty is used it implies very generally an act or deed that is a requirement or a task. But in the present instance this is far from the truth. To appear before this body as their elected head is an honor which no man can but feel is the culmination of his highest ambition. I am not unmindful that to address you is a privilege accorded to but few physicians. It is such a privilege that I cannot help but feel that, no matter how unworthy I am to have succeeded the distinguished men who have preceeded me, how incapable I may have been to take their place, to stand where they have stood, how inadequate my few talents may be to head such a splendid body of men as make up this College of ours, I repeat I cannot help but feel a glow of pride and a warmth of heart that surpasses any that I have ever before felt, to come before you tonight and to address a body whose membership is composed of the cream of the practicing physicians of this United States. Our Fellows come from every state in the country. In the aggregate they make up an organization whose members are active scientifically and professionally, whose purposes are of the highest and whose standards represent the best in medicine. The American College of Physicians is virile, progressive and always growing. It is a great organization and one to which any Fellow may feel a justifiable pride in belonging and whose officers appreciate fully the responsibility which goes with the honor of representing it.

Before proceeding with the accounting of the year's activities, let us pause to pay tribute to one who has meant so much to the College in the past and whose tragic death came to all of us as a heavy and cruel blow. John Phillips was taken from us in

*Delivered at the Minneapolis Meeting of the American College of Physicians, February 12, 1930.

his prime. A keen scholar, an indefatigable and tireless worker, a beloved physician, a man whose counsel was sought and welcomed, his broad-minded, sane and serious judgment will be missed at the meetings of the Regents as his cheerful and sunny smile, the firm and friendly grasp of his hand, and his happy greeting will be no longer here to welcome us at this and at future meetings. In addition to this great loss the College has had erased from its rolls by the Great Bookkeeper the names of nineteen Fellows and three Associates. Some of these Fellows have been active in the organization, some have played a passive rôle, but all were fine men of the highest stamp professionally. It will be impossible to read even a brief obituary of all of these mourned Fellows, but I can not let the opportunity pass without saying a short word to the memory of three of these men whom I knew personally. One of them, Arthur S. Loevenhart, was a man of national reputation; a great scientist, a brilliant teacher, a clever investigator, his death removes from academic medicine one of its great leaders. John A. Witherspoon was a doctor of the old school, a practitioner of note and a consultant whose services were sought after throughout the South. His fame was not limited to but one section of the country; so well was he known throughout the United States that he was honored with election to the Presidency of the American Medical Association. C. E. de M. Sajous was one of the original members of the College. His reputation in the field of endocrinology needs no reference here. His name was as well known in Europe as in this country.

It is but natural that in such a large body as the American College there should occur yearly a considerable change in the roster of the organization. Death has removed some, there have been several (four) resignations for various causes, no one of them in any way reflecting on the dignity of the College, nor the sincerity of its purposes. To replace these few who have gone there has been a large number of men selected for membership in the College. During the year 1929, there were elected from January 1 to April (Boston meeting) 190 Fellows and 53 Associates. To October 27, 82 Fellows were granted favorable recognition and at this meeting there will be recommended for full membership 88 names, and for associateship 49. During this same time there were an equal number of men refused admission to the organization because they could not meet the ever increasing qualifications that are required for membership and a very considerable number of applications were withdrawn even before they were brought to the Committee on Credentials. Despite the high standards required of prospective members, our numerical yearly increase is considerable. The thought arises as to just how large should the College be. Should we continue to expand and to grow at such a rate as we have in the past few years? It is true that with the new admission requirements, our growth will be presumably lessened for several years, but after this temporary regression

it is right to assume that there will be an ever increasing influx of proposals for membership. Mere size does not indicate any peculiar virtues, but a healthy growth is to be encouraged. How best to achieve this without becoming too bulky, and yet to keep our doors open to the type of man we wish to commingle with us means a delicate adjustment, a balancing which will require skillful handling by those who have the affairs of the College in their hands. Already the College has attained a size which prevents us from accepting many invitations to meet in the smaller cities. We require not only sufficient hotel space to accommodate a large group of men, but, also, because of the very important clinical features of the programs, our meetings must be held in medical centers where there are a sufficient number of hospitals to afford a diffuse, wide-spread selection of cases, and above all room enough to accommodate those who come to hear, see and learn at the clinics. I can foresee in the not far distant future that sectional meetings will be a part of our educational program in order to allow a getting together of all our members yearly.

One of the encouraging features of the past year has been the increased interest evinced in life membership by the Fellows generally. Some five of the Fellows, Ernest H. Falconer, J. A. Lepak, Francis M. Pottenger, William D. Sansum, and Austen Fox Riggs, have concretely shown that they appreciate the mutual advantages to themselves and the College of such a membership. To the College it means much. These dues are set aside on a separate endowment fund which will be used to further the scientific aims of the College, for such purposes as the proposed establishment of a Memorial to the memory of John Phillips, an action which should and will redound to the credit of the College.

I have mentioned briefly, in discussing the size of the College, the difficulties that will be encountered in finding satisfactory meeting places. Let me dwell for a minute upon the tremendous demands that are made upon him who is chairman of the annual convocation of the College. Each year one of the Fellows volunteers to arrange the program. This requires not only the getting together of a scientific program, and the arrangement of clinics, but also a host of details must be attended to which require a tremendous amount of thought and time. I wish for a moment to congratulate Dr. S. Marx White, who has so ably gotten together this magnificent program we are privileged to enjoy this week. He has labored long and hard, and without thought of self.

One of the very real accomplishments of the College of Physicians is the publication of a superb medical journal, a journal which this year gave to its readers 1,370 pages of scientific material, medical abstracts, book reviews, editorials and College news. I sincerely hope that every Fellow of the College appreciates as he should the tremendous value of the sections devoted to abstracts and reviews. Written by a student of

medicine, they represent the mature thought of one who knows of what he writes and who from his wide knowlege can give a critical and unbiased opinion of his subject matter. We are fortunate indeed to have as the guiding hand of the Annals, one who works so devotedly and unselfishly, Dr. Aldred Scott Warthin.

There is one other subject germain to this part of my address devoted to the present status of the College that I would make mention of in passing. Criticism has been leveled at us in the past for the relatively high fees demanded from the members of the College. Dr. Martin, in his Presidential Address last year, answered these unfavorable comments fully. Suffice it to say here that the Regents have ever before them this not entirely unjustifiable criticism. It will and has received their constant attention, but big things and great accomplishments require money and the College will do greater things in the future than it has in the past and will be of greater service to its members than it has ever been before. There are so many things it could and should do that a stultification of these possibilities by lack of funds, to me as an individual, seems unworthy of our splendid organization.

I would like to digress at this point and touch upon several subjects which are of interest to us primarily as physicians and which may not bear directly upon the business and interests of the College. It may be that such a digression is not inappropriate in view of what has just been said about affairs financial and will not be out of place in addressing you this night. It is assuredly true that we are gathered here primarily for the purpose of learning, of hearing of the advances in medicine and of informing ourselves of what the other man is doing. Our meetings are purely scientific. May it not be that the College should interest itself in some of the problems of medicine that are agitating the public as a whole, as well as many forward thinking doctors, men of the profession who are not satisfied to live in the little world of routine practice, to limit their horizon to the care of the individual, but who see and appreciate that great changes are occurring in medical practice, and that even greater ones are bound to happen within this coming third decade of the twentieth century. The science of medicine has advanced with giant steps the last fifty years. We have been living in an age of great discoveries and tremendous advances, medical, physical, chemical and industrial. We have only just begun to assimilate many scientific truths within the last few years, and while doing this, have been prone to overlook facts of a practical nature that have to do with the profession as a whole. To the older medical man, satisfied with his limited sphere of activity, and thinking in terms of self, the changing educational, economic and social phases of medicine have meant but little. To the youngster just starting his medical life, things as they are seem to be things as they have always been, yet the practice of medicine when analyzed by the thoughtful thinker has altered tre-

mendously since the War. Educational standards have been markedly raised, hospitals and hospital beds have increased at an eventful rate, industrial medicine has come forward with the increase in size of our great corporations by the amalgamations of smaller concerns unable to provide, from their limited budgets, for medical service for employees, state medicine in many guises is creeping in, public health activities are manifold and varied, the collection of medical specialists in co-operative groups is nation-wide. All these and many more factors, are revolutionizing perhaps not the science but at least the art of medicine and are changing the fundamental methods of practice of our fathers! Still greater changes are as sure to happen within the next twenty-five years as is the sun to rise to-morrow. The practitioner of to-day, I venture to say, would in 1955 be as a stranger in a strange land if lifted bodily from now to then, without the gradual transition that will take place.

The question arises as to the future of this great organization in relation to medicine, other than the scientific. Should we sit with apathetic indifference and watch the waves of popular caprice roll over us? Or should we endeavor to sound out and to find out the sentiments of the members of our organization in reference to many of the problems of present day methods in medicine. I grant you that it would be beyond the power of the College, and the pocket-book, to delve into such questions as the cost of medical care, the scarcity of physicians, state medicine and so on. Many of these problems can and should be left to organized medicine as represented by our country, state and national organizations. Here let me interpolate a word about organized medicine. I consider it the duty of every member of the College to belong to the American Medical Association. Only with such an organization will we be able to attain a solidarity which will prevent the individual medical man from being ridden over by nation, state, or lay and popular bodies.

To return to the subject of the future purposes of the College: as to whether or not we shall as a body interest ourselves in vital contemporaneous problems. If the College of Physicians should go on record, after a survey of its members as opposed to or favoring such and such plans and schemes and ideas as crop up from time to time, would it not be of inestimable value to the profession as a whole or to investigative bodies to know that a group of doctors representing a cross-section of some of the best minds of the profession had taken a definite stand on the question? Let us analyze such a question as that of state medicine. Always has state medicine been a shibboleth of fear, a watchword of danger, to the average medical man. Yet what cogent reasons have we to fear the entrance of the state into medicine? Most certainly in Europe the physicians have greatly benefitted by increased socialism in medicine. The English panel system, fought courageously and bitterly for some years, has materially

improved not only the economic status of the physician, but aided him in the practice of scientific medicine. In our country it is said that one-third of all doctors receive more or less financial returns from governmental agencies. Consider the large number of men with whom you are personally acquainted who depend entirely or in part for their income from municipal, county, state or national bodies, be they school boards or the Departments of War, Navy or Commerce. Perhaps state medicine would do away with the large amount of gratuitous work that in urban communities a physician does in the out-patient departments of hospitals and in the in-services as well, while in rural sections of the country the poor man pays if he can and if he cannot, the physician treats him and his family just the same. Doctors are intensely individualistic. That is why when only superficial thought is given to the question of state medicine they oppose it and seem to be rigidly against it. Perchance were the Fellows of the College to give due weight to the pros and cons of the problem they might think differently. They would look at the question, not from a selfish point of view, but from an impartial angle. They would consider the other man as well as themselves. I do not know the answer, but I do realize that there is much to be said in favor of governmental medical aid to the poor, both from their standpoint and that of the physician. I believe that the Fellows of the College appreciate this as well and that a definite, unbiased expression of opinion could emanate from this source.

It may be that I have selected as an example a proposition at the moment unsuitable for exposition as being a thing of the distant future—which it is not. I will discuss briefly two others: first, the so-called scarcity of physicians and, second, the cost of medical care. Before dwelling on either of these two present-day problems, let me call your attention to the fact that the greater part of the agitation now going on concerning them is provided by lay bodies. The individual physician is not questioned as to his opinion or to his idea of the solution of something that is decidedly in his realm.

As to the shortage of medical men. Does such a condition exist? Is it not a hypothetical condition which is causing uneasy discussion? Is it not that there is not a lack of doctors in certain regions, but rather a dissatisfaction because a doctor is not at the immediate beck and call of any one who may want him at the moment? It would seem to me that the American public has become used to having their every wish and want satisfied. Extremely few communities suffer from lack of medical attention, but because a doctor is not at hand for their immediate care they think they are neglected and suffering.

The College of Physicians represents doctors from every section of the country, from cities and towns all over the United States. A poll of the membership would show very definitely whether or not such a state as supposed exists, actually is present in any section of the country.

The ever increasing cost of sickness is another agitating question of the day. By inference it is always presumed that it is the high cost of medical attention that is responsible for this very real problem. Actually, this is not so. More money is spent for drugs than is paid doctors is one of the findings of an investigation in certain districts by the committee on the cost of medical care. Untold millions are spent for useless and worthless, even dangerous, patent medicines. Hospitals receive enormous sums each year, partially because patients want the best accommodations in these institutions, whereas were they to go to a hotel they would not select the most expensive suite in the highest priced caravansary in the city they are visiting, but would choose a room within their means in a cheaper hotel. The cost of unnecessary nursing must be added to the bill, as well as many other expenses, too numerous to enumerate. The physician finds that while he presumably is responsible for this high cost of getting sick, actually with the characteristic altruism for which he is always noted, it is he who is willing that his bill be the last paid, and he is the only one who is expected to reduce his charges. The economic disruption of the individual and the family is a real problem and a live one, but I do protest against the very general conception that the doctor is the responsible agent. A frank and free discussion of the subject at one of the yearly meetings might be a real assistance to those who are attempting to find the correct answer as to how the middle class man with small income can finance illness. While it is unlikely that some brilliant scheme might be presented to the world at our annual convocation which would materially aid in the solution of the enigma, at least an expression of opinion could be had from a body well qualified to make such a stand.

It may be that there has been found among the Fellows a marked divergence of opinion concerning the possibility of increasing the activities of the organization and more particularly of removing our self-imposed limitations of dealing only with scientific medicine and to discuss at future meetings certain economic, social and financial phases of medical practice which would interest a considerable number of our membership. It can be readily appreciated that such a step is well outside of present policy, which has confined itself entirely to the presentation of scientific papers, the publication of a splendid medical journal and a very limited social program. I would not propose that there be any very great upheaval in our present arrangements. The College is primarily and entirely a body devoted to the scientific aspects of internal medicine. As such it has a very definite place in medicine, acting more or less as a certifying body which puts the stamp of approval upon its membership as men qualified to handle adequately and thoroughly by the best available methods patients ill with diseases of certain types. Should we extend our field of vision and enter into wider fields, discussing and possibly deciding upon matters which are decidedly controversial? Such a change

in our proceedings would make for a decided change in the policy that now governs the organization. My personal view is that this should be done in a limited way. The three major functions of the organization I have outlined, but certainly there are other minor obligations to our members and to the profession at large which we should undertake.

In conjunction with the important questions that I briefly sketched in the early part of my address, it might be entirely possible each year to deal with one or two of these subjects or such other problems that might at the time be thought-provocative and fact-inspiring. Specifically, one session of our program might be devoted to the cost of medical care. This session could be more or less informal in the form of a round table discussion, the proceedings to be opened by several papers which were authoritative as a result of collection of facts, data and statistics. Succeeding this there could be a general discussion in which various Fellows could express their views and opinions. The preliminary paper or papers would take from 20 to 30 minutes in being presented, while during the general discussion the speakers should be limited to five minutes. If there was any uniformity of opinion, resolutions might be passed expressing views one way or the other. It would seem advisable to determine upon a subject for discussion some twelve months ahead of the succeeding meeting and either a committee or one man be appointed for the purpose of getting together facts and collecting data largely from the individual members of the organization. Such information could be collected by the questionnaire method and they could be analyzed and then submitted to the body as a whole in the form of one of the preliminary papers just mentioned. The five minute discussions would be largely to permit any individual Fellow to dilate upon and to enlarge upon his opinions which were answered briefly in the questionnaire. By methods such as this our organization would definitely go on record as to the feeling of the majority of its membership upon such questions. It would give to the bulk of our membership the opportunity of expressing themselves. Many of our Fellows coming from smaller communities and not connected with large hospitals and clinics, feel that their experience is too limited to prepare papers to be read at the annual session. While this is very largely, I believe, an entirely too modest assumption, nevertheless it is so, but any physician or internist, no matter where located, has the opportunity of cogitating upon and thinking about and coming into contact with some of the contemporaneous problems of medical practice. They may be loath to express themselves concerning scientific subjects, but certainly many would freely and willingly undertake to delineate on these questions of the day.

And now I would like to say a word to the new members who have just joined the American College of Physicians. I would say to you that you are welcomed to our organization. You are in a position to give much and you are fortunate that you will

receive much from your associations with the other internists in our large group. You can give much by attendance at the meetings. Your mere presence will add to the enthusiasm of any given meeting, for the presence of a goodly number of auditors is an inspiration to any speaker, and you can help, aid and assist in this particular way. You are in a position to contribute to our scientific programs. You can give by contributing to the Annals of Clinical Medicine. You receive in turn membership in an organization which is composed entirely of representative, high-class, successful practitioners of medicine. Your qualifications as doctors, your integrity of purpose and your high ethical standards have been judged not only by the Committee on Credentials, but also by those physicians who are in your city and locality; and you, in turn, will have the privilege of passing upon future candidates from your section of the country. By your work, by the approval of your fellow practitioners, you have been shown to be men of industry, capable, well educated and governed by the high ethical principles of the medical profession. Membership in our organization gives to you a professional stamp and attributes an ethical standard by which we should all be trying to live and to practice. I feel that you are to be congratulated upon your election to the organization and by the same token I believe that the College is to be congratulated upon having you as members. In your hands lies the future of the College.

Colloids in Medicine*

By Ross Aiken Gortner, *Professor of Biochemistry in the University of Minnesota, St. Paul, Minn.*

COLLOID chemistry has been defined as "the chemistry of the infinitely little." It can perhaps be better defined as *the chemistry of films, surfaces, and interfaces,* for the peculiar energies which are available for the reactions of colloid chemistry are those energies which are characteristic of surfaces and interfaces.

For purposes of classification it has been rather generally agreed that particles which range from 1.0 mμ to 0.5 mμ lie within the colloid realm, and the reactions which such systems show can in the last analysis be traced to reactions which are induced by a decrease in the free energy which resides in the interfaces present in the systems. It is for this reason that the chemical nature of the finely divided colloidal material is in many instances relatively unimportant and that colloidal sols prepared from very different types of chemical materials may exhibit very similar properties or induce similar reactions.

The surface area which characterizes colloidal systems is almost beyond comprehension. Thus, for example, if a cube of material one centimeter on an edge with a total area of six square centimeters is subdivided into material 0.1 μ on an edge, the surface area has been increased to 2,117 square feet, and if one progressively decreases the size of the particles to the lower limit (1.0 mμ), one arrives at a system which contains 1,000,000,000,000,000,000,000 particles, having a total surface area of 211,740 square feet. In such systems there is an alteration of the affinities and energies of the molecules and atoms in the surfaces, so that they become different from those in the bulk of the material, and it is to these altered affinities that colloid systems owe their peculiar reactions.

All permanent colloid systems are stabilized either by the presence of an electric charge (a so-called Helmholtz double layer) which exists at the surface of the micelle or because of the affinity of the particle for the solvent in which the particle is dispersed, and in general those colloid systems which are characteristic of living organisms possess both factors of stability. Those colloids which show no appreciable affinity for the medium in which they are dispersed are known as lyophobic colloids, whereas those which combine with the medium are termed lyophilic colloids.

*Read at the Minneapolis Meeting of the American College of Physicians, February 10, 1930.

In a discussion of colloids in medicine one could perhaps devote considerable attention to the rôle of lyophobic colloids in the diagnosis of disease, or of the colloidal metals, such as lead or copper, in the control of malignant growths. Thus, for example, the precipitation limits of systems containing colloidal gold and (later) gum benzoin[1,2,3] have been utilized to differentiate paretic from normal cerebrospinal fluid. While such colloid chemical studies are of undoubted importance to medicine, there are certain other problems, pertaining to all living organisms, which deserve the attention of the physician and the research worker.

The human body—in common with all living organisms—is composed of chemical materials which, by and large, may be classified into five great groups, (1) proteins, (2) carbohydrates, (3) fats and lipides, (4) inorganic salts, and (5) water. There is, it is true, a number of compounds, which are characteristic of the cells or tissues, which do not fall definitely into any one of the groups of the above classification, but the amount of such compounds is extremely small, although undoubtedly in many instances they play very important rôles in physiology. Since, however, we have little or no knowledge as to the rôle which such compounds may play in the living organism, considered as a colloid system, they can be omitted from the present discussion.

Of the five great groups which we have noted, the proteins are certainly in the colloidal state. They belong to the group which has been classified as the lyophilic colloids. In the biological organism they exist associated with relatively large amounts of water, and in most instances are stabilized as a colloid system both by their hydration and by the presence of an electric charge.

In the plant organisms the carbohydrates may comprise a very considerable part of the tissue, and such complex carbohydrates as cellulose, starch, pentosans, gums, and pectins may account, even to a major degree, for the colloidal behavior of plant tissues or organs. In the animal kingdom, however, carbohydrates or carbohydrate derivatives appear to play an almost negligible rôle, although, when we know more of the colloid chemistry of nervous tissue, it may well be that the carbohydrate radicals which are present in the cerebrosides may be found to contribute materially to the physico-chemical properties which are peculiarly characteristic of nervous tissue.

The fats and lipides exist in the living organism largely in the form of emulsions, and since emulsions are systems which are characterized by a dispersion of oil-in-water (or water-in-oil) and accordingly possess large internal surface areas, emulsions may be properly classified as falling within the subject matter of a discussion of colloids. Certain of the lipides, notably lecithin and the associated phospholipides, show marked affinities for water and may be classified as true lyophilic colloids.

The salts and molecularly dispersed solutes characteristic of cells are in general considered as existing in true solution in the water of the cell or tissue, and, as such, as obeying the

classical laws of physical chemistry. However, the presence in such solutions of extremely great surface areas, such as characterize the colloidally dispersed proteins, fats, etc., brings about conditions whereby a very considerable proportion of the supposedly molecularly dispersed materials may be adsorbed at the interfaces and thereby be removed from the aqueous phase. The chemical reactivity of molecules or ions when present in an adsorbed condition is vastly different from the chemical reactivity of such molecules or ions in a true solution, which possibly accounts for many of the peculiar reactions of living matter that cannot be explained by the application of classical laws.

The human body contains more than sixty-five per cent of water, and in certain living organisms, such as the *Medusae,* the percentage of water may be as great as ninety-nine per cent. The fact that a part or all of this water may exist in a different state in the living organism from that which characterizes water in bulk has been rather generally ignored in our studies of biochemistry and physiology. Undoubtedly the water which is associated with the lyophilic colloids possesses properties very different from those of water in bulk, and in any consideration of physiological problems, one is not justified in dissociating the protein, which is present, from a very considerable proportion of the water in which it is dispersed. The protein micelles are hydrated, and the unit which is reactive is not only the amino-acid complex, which we call protein, but is the entire hydrated micelle. The reactions of the cell will never be explained by studies of the dry chemical constituents which comprise that cell, and if the cell reactions are ever explained, they will be ascribed to reactions which are characteristic of a colloidal system in which water is the chief constituent. Undoubtedly there exists within the biological organism and within each cell and tissue of that biological organism an equilibrium between "free" and "bound" water, *i.e.,* between that portion of the water which is free to act as a solvent and that portion which is intimately associated and "bound" upon or "dissolved" in the organic micelle.

Apparently the first suggestion that a free $\lesseqgtr$ bound water equilibrium exists in the body was proposed by Balcar, Sansum, and Woodyatt[4] under a subtitle, "A Physicochemical Theory of Fever." In this paper they proposed a theory that fever resulted as an alteration in the free $\lesseqgtr$ bound water equilibrium which characterizes normal tissue and that it was the disturbance of this equilibrium which brought about the temperature response. They were unable, however, to devise methods for demonstrating a changed equilibrium.

That "bound" water, as such, is a factor in physiology was demonstrated in 1922 by Newton[5] in a study of the nature of winter-hardiness in plants, using a method proposed by Newton and Gortner[6] for the approximate estimation of "bound" water. In later studies, Newton[7,8] confirmed and extended his original observations and showed that not only winter-hardiness but also drought resistance[9] was influenced by a free $\lesseqgtr$ bound water equilibrium. Somewhat later, Thoenes[10]

devised a new technic for the study of this problem and demonstrated that the muscular tissues of young animals possessed a greater proportion of "bound" water than did the muscular tissues of older animals. This is in the direction that one would expect. We know that colloid gels, such as gelatin, silicic acid, agar, etc., prepared under laboratory conditions undergo an aging process which is characterized by a syneresis of the liquid from the gel and a lessened water-holding capacity of the gel. To what extent the decreased water-holding capacity of biological tissues may be correlated with problems of senescence, *arteriosclerosis,* and decreased glandular functioning cannot be decided from our present knowledge and must await future biocolloid research. Reasoning from analogy, however, this field promises exceedingly important developments.

Following the technic of Thoenes, Robinson[11,12,13,14] studied the problem of winter-hardiness and related phenomena in insects and demonstrated that winter-hardiness in insects differed in no essential particular from winter-hardiness in plants, in that both phenomena are characterized by a binding of the water by the lyophilic colloids present in that organism.

We have, therefore, from these studies apparently a generalization of a free ≶ bound water equilibrium which is shifting within the organism in response to external stimuli, and data are already available which indicate that internal stimuli are capable of producing as great or greater changes in this equilibrium. That such changes are of importance in medicine must be obvious. The whole problem of edema rests in the last analysis on the affinities of the lyophilic colloids of the tissues for water. A decrease in the water-binding capacity of the tissues will release fluid into the tissues or body cavities, whereas an increased affinity will draw water from the blood or lymph stream, and thus alter the equilibrium which characterizes health.

Robinson[15] has continued his studies on the water equilibrium at the Otho S. A. Sprague Memorial Institute and has demonstrated that from the colloid chemical standpoint the living organism must be looked upon as an entity and that alterations in the free ≶ bound water equilibrium in the blood stream are reflected by alteration in the muscular tissue. His studies indicate that many of the anesthetics and drugs produce a very definite alteration in the free ≶ bound water equilibrium of the organism. If Robinson's work is borne out by future research, it will necessitate the writing of a new physiology, the physiology of the organism as a whole rather than the physiology of individual cells and tissues.

Inasmuch as proteins comprise the major group of organic compounds present in living tissues, certain of the colloid problems of protein chemistry become of unusual significance. In 1908, the American Society of Biological Chemists and the American Physiological Society appointed a joint committee to prepare a logical classification of the proteins. In the report of this committee[16] the words, "solubility" and "soluble," occur many time and in many instances "solubility" is

the criterion upon which protein classification is based. Colloid researches, however, have demonstrated conclusively that with the probable exception of the albumins,[17] proteins probably do not exist in water as molecular dispersions but rather as colloid micelles, in which case the water "solubility" is meaningless and the colloid term, peptization, should be substituted. Globulins were defined as "simple proteins, heat-coagulable, insoluble in water, but soluble in dilute solutions of the salts of strong acids and bases," and for twenty years this definition was unchallenged. In 1928, however, Gortner, Hoffman, and Sinclair[18] undertook the isolation of a series of proteins from wheat flour. Using in their study twenty-two different salt solutions, most of them in four different concentrations, they found that each salt solution in each concentration extracted a different amount of protein from the wheat flour. Thus, for example, using equi-ionic (1.0 *N*) concentrations of the potassium halide salts and taking care to adjust the solutions so that they had identical hydrogen ion concentrations, they found that potassium fluoride extracted 13.07 per cent, potassium chloride 22.77 per cent, potassium bromide 37.22 per cent, and potassium iodide 63.89 per cent of the total nitrogen. The "solutions" of protein in these salt solutions were optically clear. These authors, therefore, definitely raised the question as to *what salts* in *what concentrations* should be utilized for the extraction of a protein entity which could be characterized as a "globulin," and expressed the viewpoint that none of the salts in any of the concentrations used would extract a definite single chemical entity.

In a continuation of these studies, Staker[19] investigated a large series of seeds and grains, including most of those which had been earlier investigated by Osborne. Staker's findings were in every respect a confirmation of the earlier studies of Gortner, Hoffman, and Sinclair, as indicating that protein solubility was in reality the peptization of lyophilic colloid micelles.

Following a rigidly prescribed technic of protein extraction and purification, a given amount of a given product can always be isolated from the same biological starting material, but if the technic of isolation or purification is altered in any way, then the end product will be obtained in different amounts and will show different physical and chemical properties. We must therefore recognize the fact that when we study the proteins we are dealing with colloid systems and that these colloid systems do not obey the laws of classical chemistry. This fact becomes of especial importance in problems of immunology. The globulins have been divided by "solubility" methods into euglobulins and pseudoglobulins, and there is an ever increasing tendency toward further subdivision. It may be that such fractionation will result in scientific advances, but there is no assurance that either euglobulins or pseudoglobulins represent definite chemical entities or that any of the proteins which have been isolated from biological tissues represent an entity which was actually present in the living organism. This viewpoint has been very admirably expressed by Abderhalden[20] when he

states, "Each conception in regard to particular structural relations in proteins, and especially of those which are concerned in living processes, must take into consideration all their reactions, their ready transformation from the natural to the denatured condition, and their greater or less lability. It is certain that proteins in protoplasm have properties of which we are at present entirely unaware. We study proteins almost invariably in a greater or less changed condition. On the one hand, we have proteins which in a certain sense are denatured in the organism, and outside of the organism undergo further changes. Thus, for example, we see the silk threads, the web of the spider, the byssus of certain mussels, etc., which are extruded as a liquid, changing to an inert solid. From a very labile form they are transformed into a very stable structure. In living processes we deal with the very reactive cell proteins which regulate in a fine degree the reactions of the cell, but when death ensues, the cell proteins coagulate and lose in a large measure their characteristic physical behavior."

These conclusions of Abderhalden cannot be too strongly emphasized. We will never explain the colloid reactions of a cell by the colloid reactions of any one of the components of that cell; neither will we explain the colloid reactions of an organism through a study of the colloid reactions of individual cells or tissues of that organism. Colloid chemistry, as applied to biology, is still in the exploratory stage. Much of new technic has been introduced in the past few years and much more technic must be devised before we can hope to solve many of the major problems of physiology. Since, however, the chief constituents of living matter are in the colloid state, the technic and viewpoint of the colloid chemist offer the physiologist and the physician one of the most valuable tools in the study of vital phenomena.

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Cerebral Localization* **

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THE importance of the grey matter of the cerebrum was first emphasized by Gall and Spurzheim. The cerebral hemispheres were thought to be divided into as many pairs of particular organs as the functions they subserve.

In 1825 G. R. Boullaud described the symptoms of aphasia in a series of cases and was able to show that the frontal lobe was diseased in all cases. A little later (1836) M. Dax demonstrated that cases showing disorders of spoken language suffered from lesions of the left cerebral hemisphere. In 1861 Paul Broca confirmed the conjecture that there was a given center for sensation, motion, and special memory in the left cerebral hemisphere, specifically, in the lower segment of the third frontal convolution.

A brilliant introduction of a new chapter in our knowledge of the function of the brain was effected by the work of Fritsch and Hitzig (1870) in their memoir "On the Electrical Excitability of the Brain." They gave the name of centers to those areas which when excited by direct application of a galvanic stimulus reacted by muscular movement.

Ferrier's (1873) use of faradization of the cortex enabled him to precisely chart out a number of centers in the cortex of the dog. H. Krause, Beevor and Horsley described the excitable zones of the cerebral cortex of the monkey, and later observations were made on man by Ferrier, Horsley, Beevor, Bechterew and F. Krause. The theory of cerebral localization having been established, further physiological research, clinical observation and correlation with pathologic studies and biopsical observations permitted by neurosurgery, rapidly led to a comprehensive knowledge of the localization of motor areas, sensory areas, and areas of hearing, speech, taste and vision. The function of the basal ganglia, the cerebellum, the brain stem —in short of the whole central nervous system has in a remarkably short time been put to experimental proof, and although much remains to be learned the chief functions of the central nervous system are known.

Because of this knowledge the localization of well developed lesions in the central nervous system may readily be accomplished in the majority of cases. Such localization is of value not only in relation to the removal of tumors, or drainage of abscesses, but also in

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**Read at the Meeting of the American College of Physicians, Minneapolis, Minn., February 10, 1930.

the matter of diagnosis, as in the differentiation of subarachnoid hemorrhage resulting, for example, from a ruptured aneurysm from intracerebral hemorrhage, of a cerebral abscess from an extradural one, or meningitis or sinus thrombosis.

It is of value in recognizing certain disease entities, as progressive lenticular degeneration, parkinsonism, and other diseases of the basal ganglia, in determining the particular vessel involved in a thrombotic process, as in lesions of the posterior-inferior cerebellar artery, and in cases too numerous to mention.

When of sufficient size and of certain character the localization of most of the tumors may be accomplished. It is necessary only to allude to the principal signs and symptoms occurring as the result of lesions of a few of the parts of the cerebrum to illustrate this. Bitemporal hemianopsia is found chiefly in lesions above the chiasm, in pituitary adenomas; prefrontal tumors are characterized by weakness of the facial muscles chiefly in the movements evoked during emotion, by convulsions and mental change. When on the left side there is often disturbance of speech. Lesions in the pre-central gyrus are characterized by focal or jacksonian convulsions in addition to motor paralysis. This motor aura of a convulsion is analogous to such sensory ones as are seen in lesions of the uncinate gyrus, wherein a sensation of a disagreeable odor precedes the convulsion, and in a lesion of the occipital lobe of visual hallucinations preceding a convulsion. Temporal lobe lesions frequently are associated with quadrantic defects in the field of vision and occipital ones with hemianopsia. A combination of a hemiplegia with a hemianesthesia and hemianopsia is indicative of a deep-seated lesion about the internal capsule. The relative convergence of function of sensation, general and special, permits the utilization of localizing lesions of the angular gyrus by alexia, of cortical involvement of the visual centers by the presence of central blindness, or of disorientation as to place; for example, when a patient with a homonymous hemianopsia loses himself in his own home.

Were it true that all tumors resulted in so positive objective phenomena so readily discerned, it would be unnecessary to read further. If one's memory failed, a consultation of any book on neurology would enable one to easily fit the signs and symptoms into any particular localization. Unfortunately, this is not the case. The purpose of this communication is to point out some particular, and, possibly to many of you, trite methods of observation of some signs which are of assistance in the localization of cerebral lesions.

Let us suppose that one is called to see a case of a patient in coma, who has a history of headache and vomiting, who has a choked disc, and has had a sufficiently profound mental change to justify the diagnosis of a frontal lobe tumor. Which side is involved? Or, given a man with typical uncinate gyrus fits, indicating a lesion of the temporal lobe, but who has no defect in the field of vision, which temporal lobe is involved? Or, a man giving a history of epileptic convul-

sions preceded by hallucinations of red flames, how are we to determine the presence of a hemianopsia if he is semistuporous or has moderate clouding of consciousness?

One of the most fruitful sources of information is the condition of the reflexes. Of course, as you recall, in all cerebral lesions affecting the pyramidal tract, the deep reflexes are increased, the superficial ones diminished or absent, and at times such pathological reflexes as the Babinski are present.

Not only is it necessary to determine the presence or absence of these reflexes, but it is necessary that changes in their response to stimuli fit together in a logical sense. If one obtains what he considers to be a Babinski and the deep reflexes of that side are not increased, and the cremasteric and abdominal reflexes are brisk, considerable doubt is thrown upon the validity of that observation.

This does not mean that all of the deep reflexes must be increased on that side, or that all of the superficial ones must be absent, but if any difference in the response of the deep reflexes occurs they must predominate on the side where the Babinski is elicited, and when the superficial ones are diminished it is on that side that the diminution must be present to enable one to use the Babinski sign as a localizing reflex. If one finds an apparent weakness of the right side, if the superficial reflexes are more brisk on that side and the deep reflexes diminished on the same side it is likely that what appears to be weakness is defective movement due to a lesion of the cerebellum or its connections. Rarely may we find an increase of deep reflexes on the same side as a cerebellar lesion resulting from pressure of the *opposite* crura cerebri against the incisura. So important is this difference in reflexes that one should never be content with simply striking the patellar or Achilles tendon carelessly with a hammer or, worse, with the hand. Not only must one carefully record the rapidity and extent of movement of an extremity to stimuli of increasing amounts, carefully comparing the two sides, but also that degree of stimulation necessary to first evoke a deep reflex must be ascertained, and *all* of the deep reflexes must be examined. When no difference may appear to be present in the knee-jerks, epipatellar blows may enable one to determine such a difference. When the Achilles-jerks may seem equal when the patient is examined in bed, a difference may be made out when the patient kneels on a chair and the tendon Achilles is tapped with succeeding different degrees of force. Similar care is necessary in examining the superficial reflexes. The presence or absence of a Babinski or the absence of a plantar reflex is not all that can be elicited from stimulation of the sole. The character of withdrawal, the difference in degree of stimulation necessary to provoke any motor response, are equally important. It is not sufficient to stroke the inner surface of the thigh with a pin to elicit the cremasteric reflexes, or the abdominal wall to elicit abdominal reflexes. The strength of stimulation must be carefully determined, and although stroking the abdominal wall

with a pin may evoke a reflex, if one lightly rests a pencil upon the lateral portion of the wall and stroke inward, using only the weight of the pencil, the reflex may be obtained on one side and perhaps not on the other. Often when these little differences in reflexes are fitted together, such as an increase of all deep reflexes and a diminution of all superficial ones on one side, they may suffice with little else to localize the side of the lesion. More frequently motor disturbances are needed to further justify a diagnosis. When gross weakness occurs of course it is a simple matter, but very often there is little difference in the grasp of the patient. He is able to perform all movements apparently with good strength. He may be able to walk well and be unable to state definitely as to the existence of any motor disability. It is to this particular part of the examination that I wish to direct your attention.

Many little signs of hemiplegia have been described, but I will allude chiefly to those which have been found useful. At times it is necessary to determine the paralyzed or weak side in a semi-stuporous patient or a comatose one. Although it has been stated that under such a condition the paretic upper extremity falls more slowly when released from a passively extended position I have not found it so. With the patient lying on the back when the arm and forearm are extended to a right angle with the trunk, with the arm supported and the forearm released on the paralyzed or weak side it falls readily and completely, and if the arm be so rotated that the falling forearm strikes the face it still falls promptly, at times striking the face. Rarely it is imperfectly deflected. When the whole extremity is allowed to fall it falls flail-like. In contrast, the other side falls slowly, usually never strikes the face but is checked. Often it remains extended for a time. The paretic cheek often puffs out with expiration. When one attempts to separate the lids, the resistance on the normal side is greater, and on the paretic side the eyeball often rolls upward when the attempt to resist the pressure is ineffectual. The lower extremity at times is slightly rotated outward. When elevated and dropped it falls rapidly to the bed. When passively flexed, with the heel scraping against the bed and suddenly released, it is rotated outwardly and slides down to an extended position. While being flexed the smooth tension felt on the normal side is lacking. The umbilicus may be drawn slightly to the side opposite the weakness, and if inspirations are sufficiently deep to at times produce an upward movement of the scrotum, the movement is less on the affected side. Although both upper and lower extremities may react, by flexor withdrawal to stimulation with a deep pin prick, the character of the movement often differs in degree or efficiency. Particularly can this be made out by pricking the abdominal or thoracic wall wherein the unaffected upper extremity is the one which reaches out for the painful area. Of course, the conjunctival reflex on the affected side is lessened. When the face or forehead is pricked frequently asymmetry of facial move-

ments may be seen, even when the extremities react equally well. The nasolabial fold is deeper on the normal side, the lids are closed more strongly, the angle of the mouth drawn further to the side, and if drooling is present it occurs at the angle of the paretic side of the lips. In inspiration the aperture of the nares on the unaffected side becomes wider.

Here one may refer to the examination of ocular movements in coma. When the head is rotated to one side the eyeballs rotate to the opposite side, and extraocular muscle palsies and paralysis of conjoined movement of the eyeballs are thus discovered. Often one may even ascertain the existence of a hemianopsia by striking at a patient from one and then the other side and on the blind side of the visual field fail to produce winking. Similarly, approaching the blind side of the visual field with a lighted match may fail to evoke winking, whereas winking occurs on the normal side.

When the patient is conscious many other little signs may be observed when gross methods of examination fail to reveal any motor disturbance. As one observes a patient lying on his back, the palpebral fissure on the affected side is wider, at times spontaneous winking is not as frequent and is incomplete on this side. The conjunctival reflex may not be as effectual or easily elicited. Passive movement of the upper lid on the affected side is accompanied by less resistance, if carefully observed. The aperture of the nares is smaller. The nasolabial fold is not as deep. Rarely slight moisture may be made out at the angle of the paretic side of the lips. Although the tongue may be protruded in the midline the distance from its edge to the angle of the mouth is greater on the normal side. When the patient shows his teeth the affected side may lag slightly, or the nasolabial fold not increase in depth. Strong effort to bare the teeth on the unaffected side is accompanied by contraction of the platysma; on the affected side this very often is absent. Attempts to close the lids forcibly will show greater wrinkling about the lids of the unaffected side.

It is of great importance to observe the patient's face in repose, in voluntary action and in motion in response to emotion. Voluntary motion may be perfect but slight asymmetry exist at rest, and very often only the unaffected side will move in talking and particularly crying and laughing. Rarely the opposite state may be found.

In general, even in the absence of demonstrable weakness of the upper extremity, some clumsiness, defect in associated movements, greater fatiguability, and at times tremor will be found on the affected side. With the patient lying on his back with both his upper extremities outstretched before him the affected extremity will fall downward slightly, or deviate outward or inward after a short time. When repeatedly abducting and adducting the fingers and thumb upon command, the unaffected extremity is held rigidly extended, the affected one is abducted and adducted with each movement of the fingers. Whereas all of the fingers of the unaffected hand are abducted and adducted, on the affected hand

only one or two are so moved. The fingers often are deflected to the ulnar side and flexed at various angles at the metacarpo-phalangeal joints. At times the movements are tremulous, often the response to the command is confused. When making a fist and opening the hand repeatedly upon command the affected hand is closed to differing degrees. Upon the unaffected side the hand is extended at the wrist when the fingers are completely flexed; not so on the affected side. Throughout both of these examinations the affected extremity continues to fatigue and gradually sink downward. Associated movements of the arm at the shoulder of elevation and sinking are seen on the affected side. The patient is observed to look at the affected hand while performing the tests, because he is in a way conscious of the greater effort necessary to perform these movements. Babinski has described a test which has been found of some value: the affected side, when the extremities are placed vertically with the palms facing each other and the hands loosely shaken, pronates.

With the upper extremities extended forward, the index fingers pointing to the foot of the bed, the index finger of the affected side deviates downward and to the ulnar side. The hand at times deviates to the ulnar side. When asked to lift the extremity up and bring it down to the examiner's finger, the affected extremity, although no past pointing is present, will not move as smoothly. The extent of movement upward and downward will vary, the forefinger will be brought down on the examiner's finger with varying degrees of strength, usually bearing down hard, whereas on the normal side the finger will be brought to rest on the examiner's finger with precision and accuracy. When the unaffected extremity is raised the affected one is slightly lowered, and when the unaffected one is lowered the affected one is raised. While performing repeated lifting and lowering of the unaffected extremity the outstretched affected one begins to sink slowly. Gradually it may sink almost to the bed without the patient's apperception.

Rapid drumming of the index and middle fingers of the affected side is difficult and clumsy; although adiadochokinesia is not present, repeated apposition of the palm and dorsum of the hand to the thigh is clumsy and slow on the affected side. Touching the finger to the nose or finger to finger may elicit slight clumsiness uncertainty or tremor. The general character of the handwriting may be changed if the right side is the affected one.

In the lower extremities repeated passive rapid flexion and extension of the unaffected side is characterized by smoothness of movement, resisted by slight tension; at the heighth of flexion the flexed thigh and leg come to rest with the foot upon the bed, smoothly, without any lateral movements, and when passively extended the movement is timed so that no sudden jerk occurs. On the affected side less tension is felt, the movement is less smooth, at the height of flexion when the extremity is released, there is adduction, abduction, or both, to a slight degree, when passively extended often

no tension is felt and the leg is allowed to suddenly fall out in extension with slight outward rotation. When the extremity is repeatedly flexed and suddenly released so that the sole falls upon the bed the affected extremity sways and then extends to a shorter or longer distance. When now a sudden pressure of short duration is applied to the back of the leg it extends suddenly or sways. On the normal side the foot falls firmly to the bed, with the thigh and leg in upright position and when pushed it extends a distance proportionate to the push. The passively elevated and slowly released unaffected lower extremity is held in that position for a considerable time. The affected side fatigues, sways and is tremulous. Passive dorsal flexion of the normal foot is accompanied by active contraction of the tibialis. This at times does not occur at all on the affected side but usually is less marked. Babinski's combined trunk-thigh sign is often valuable. The patient lies upon his back, the feet separated about a foot, and the forearms flexed across his chest. Attempts to assume a sitting position are associated with elevation of the affected lower extremity. Attempts to adduct the unaffected extended lower extremity are associated with adduction of the affected one. Strümpell's tibialis sign is at times valuable although it often appears only after other evidence of involvement of the pyramidal tract is present. When the patient flexes the affected extremity with the foot above the bed the foot is held dorsally flexed to a right angle on the affected side. In placing the heel of the affected side upon the opposite knee the movement may be uncertain and discontinuous. While the heel is resting on the knee slight swaying may be seen as well as abduction. If now one pushes the flexed extremity outward either disproportionate swaying occurs or there is a tendency for the heel to slip off the knee.

While walking a slight lagging of the affected side may be noted. At times the associated swinging of the affected upper extremity is diminished. Hopping on the affected side may be normally performed when once started, but very often the patient is unable to start hopping on this side until many attempts have been made.

The demonstration of motor disability of one side when accompanied by the reflex changes destined to be present when that pyramidal tract is involved definitely localizes the side of the lesion and serves to localize such lesions in the prefrontal and temporal lobes without visual field defects. It is necessary in certain cases to differentiate slight evidences of cerebellar dysfunction from those of motor disability. Commonly the defects in synergy in the latter are fairly easy to determine, and involvement of adjacent parts—as the occurrence of a sixth nerve palsy on that side—are sufficient to call attention to the cerebellum even if the auditory nerve is unaffected and labyrinthine function normal. Often the Babinski-Weil test is of assistance. A blindfolded patient walking backward and forward will walk forward to one side and backward to the other, completely reversing his direction in from six to

eight excursions. As a rule, the signs accompanying a lesion of the posterior fossa are sufficiently marked, either as a secondary hydrocephalus or critical evidence of involvement of the vermis, hemispheres of the cerebellum or cerebello-pontile angle to permit of differentiation.

As careful observation of the differences of sensation as those of motion is necessary and often the response of "sharp" to the point of a pin may be made when considerable diminution of sensation exists. It is important to note any difference upon the two sides as to intensity and quality alike. Although a painful effect may be obtained in lesions of the thalamus, the quality of sharpness is lost.

Finally, a word about hemianopsia. The attention of a patient suffering from brain tumor often is exceedingly difficult to hold, and at times even pronounced hemianopsia is overlooked because of the seeming futility of securing any visual field examination. Often form is recognized in the defective sector of the visual field in an imperfect manner, and asking the patient if he sees the examiner's fingers, especially if they are moving, may elicit normal responses. If an object such as a glass of water is placed to one side of the patient with the vision of one eye obscured, while his attention is directed elsewhere, and he is commanded to take a drink, failure to recognize the presence of the glass of water in the blind sector of the field can be critically ascertained.

The Psychological Panel in Diagnosis and Prognosis*

Correlation of Personality Type With Susceptibility to Disease, Based upon 1400 Necropsies.

By Walter Freeman, M.D., F.A.C.P., *Washington, D. C.*

To know an organ and its diseases thoroughly is the apparent goal of many medical and surgical specialists, but to know the patient thoroughly is the goal that should be set for himself by the true physician. All the great teachers have emphasized this, cautioning their students against too narrow a point of view. Nevertheless it is only with experience and practice, backed up by humanism, that the view can be broadened, since the intensive study of a particular disease or system of organs leads to the neglect of the larger aspects of the case and of the individual in which the disorder chances to occur. When the physician has cured the disease or seen the restoration of normal function in the part he may well consider that he has performed his office and that the patient will be satisfied. But there are many diseases that cannot be cured by topical treatment, and many conditions of disordered function that will not return to normal. Then the physician must study the patient as a whole, investigate him as an individual, adapting therapeutic procedures and laying down rules of life based upon a more certain knowledge of the patient's personality, obtaining coöperation by helping the patient to adjust to his new situation. The wise physician recognizes this, and the best physician is the best psychologist.

Psychology has more than therapeusis to offer the physician, however. Diagnosis and prognosis may occasionally be aided considerably by an insight into the patient's personality. There are correlations between types of personality and susceptibility to different diseases just as there are correlations between types of personality and physique (Kretschmer), and between physique and susceptibility to different diseases (Draper). My study deals with these psychologic-nosologic correlations.

Before indicating some of these relationships between personality and susceptibility to disease, it may be well to establish various types of personalities as they are encountered in the clinic and in the outside world. Upon a behavioristic basis men have been divided into many different groupings.

*Read at the Minneapolis Meeting of the American College of Physicians, February 10, 1930.

Thus such terms as extrovert-introvert, cyclothymic-schizothymic, syntonic-idiotropic, have come into common usage not only among psychologists and psychiatrists, but also among the laity. In dividing persons thus into two large classes, there are typical examples standing at either end of the scale, with graduations between by which one passes insensibly from one type to the other. Human nature, however, is not as simple as this. It does not permit classification by a single test. More than two groups are necessary, and yet with the multiplication of groups large underlying components are neglected and similarities go unrecognized. Four to six groups would probably best meet the requirements. The ones chosen in this work are four: Schizoid, Paranoid, Cycloid, and Epileptoid. It is my intent to show that these different personality make-ups are associated in no uncertain manner with susceptibility to certain diseases and resistance to others.

The material upon which this study is based is the autopsied population of St. Elizabeth's Hospital for a period of about ten years. The figures, strictly speaking, apply only to psychotic patients, but I maintain that psychotic individuals differ from normal people only in degree, and that the same psychologic trends can be found in mentally healthy individuals if they are sought. Certainly the earlier history of the patients in the institution very often indicates the development of behavioristic trends in one direction or another long before hospitalization became necessary.

Mental Reaction Types

Individuals may be assigned to one or another of the four psychologic types by their manner of living and thinking. The schizoid individual is a shut-in dreamy person, timid, unambitious, fond of regularity and ritual in life, inoffensive, yet resistive to change even to the point of stubbornness. The paranoid individual is aggressive, arrogant, the kind that harbors a grudge and gets even. He explains his failures through the machinations of others, works hard, often bitterly, for appreciation, is ambitious, proud, sensitive, even suspicious, takes offense easily and makes friends with difficulty. The cycloid individual enjoys human companionship, is a good mixer, unreserved, emotional. He is easily depressed by misfortune but as easily gladdened by a good turn of affairs. Periods of tremendous industry often alternate with others of moody inertia. He functions best among people, makes snap judgments, is incapable of prolonged application, except when the task delights him. The epileptoid individual is affected by sudden unexplained outbursts of various types, especially convulsive seizures, but also headache, anger, asthma, etc. He is apt to be pedantic, devout, and often combines these features with some other peculiarity of personality.

Mixtures of these are often found, especially of the cycloid with paranoid characteristics, and often schizoid with paranoid elements, but it is usually possible to pick out the patients with one-sided psychologic characteristics. It is in regard to these that the data in this paper are most valid. In other words, a patient with pronounced schi-

zoid characteristics is much more likely to run true to form with regard to susceptibility or resistance to disease, than one whose characteristics are less well developed. The same is true of the paranoid or cycloid.

In dividing my own material into the four personality groups the principal psychologic trend has been the criterion. Accordingly there have been included not only typical cases but also many intermediate and borderline ones. The etiology of the mental disorder has been relegated to second place. I owe much to Dr. Nolan Lewis for sorting the patients into the various groups enumerated above. The distribution according to personality is shown in Table 1. This may furnish a rough guide to the psychologic tendencies of the outside population, although the paranoid, and especially the cycloid individual may be more frequent outside the institution because he more seldom gets into disagreeable relations with the alienist and can more often convince a jury of his peers that he is mentally sound.

showed an overwhelming incidence in the schizoid group, while malignancy in all forms predominated in the paranoid group. Circulatory disasters and chronic streptococcal infections preponderated in the cycloid and paranoid groups, few of them appearing among schizoids or epileptoids. Intestinal catastrophes were fairly common in the schizoid group, and none at all were found in the cycloid group in spite of the fact that hernia was most frequent in this category. No instance of diabetes was encountered in the epileptoid group, and malignancy was rare. On the other hand, persistent thymus and cerebral malformations were very frequent in epileptics. Acute infectious diseases and deaths by violence showed little predilection for one or the other type. Most of these results have already been reported in a previous paper, but in the other tables is a list of morbid entities based upon further study of the material. The rates are per thousand individuals of each psychologic type.

This is not the place to discuss in

Table 1. Distribution of Personality Reaction Types in Percentages.

Race and Sex	Total cases	Schizoid	Paranoid	Cycloid	Epileptoid
White male	732	48.6	33.6	10.9	6.8
White female	189	44.5	35.0	13.2	7.4
Colored male	234	58.5	16.6	13.2	11.5
Colored female	186	49.5	21.5	15.6	13.4
Totals	1341	50.0	29.2	12.2	8.6

Psychologic-Nosologic Correlations

Further study of the individual groups indicated marked variations in susceptibilities to diseases of different categories. Tuberculosis, for instance, detail the findings as indicated in the tables, since a complete study is in course of preparation. I do wish, however, on the basis of the tabulated findings, to stress the diagnostic and prognostic significance of an evalua-

TABLE 2. COMPARATIVE INCIDENCE OF CARDIO-VASCULAR DISEASES.

Disease	Cases	Schizoid	Paranoid	Cycloid	Epileptoid
Chronic myocarditis	98	41.8	125	109	25.9
Coronary thrombosis	56	22.4	92.0	30.3	8.6
Pericarditis, acute and chronic	50	14.9	74.0	54.6	17.2
Rheumatic Cardiac disease	74	38.8	102	72.8	51.7
Cardiac syphilis	49	23.9	33.2	72.8	69.0
Aneurisms luetic and senile	31	9.0	46.0	36.4	8.6
Vascular thrombosis excluding cerebral and coronary	45	29.9	53.6	12.1	25.9
Vascular ruptures excluding cerebral	20	7.5	28.1	18.2	8.6

The rates are per thousand of each psychologic type.

TABLE 3. COMPARATIVE INCIDENCE OF NERVOUS DISEASES.

Disease	Cases	Schizoid	Paranoid	Cycloid	Epileptoid
Cerebral hemorrhage	49	10.5	71.6	54.6	43.1
Cerebral thrombosis	192	76.3	238	188	147
Neurosyphilis	271	187	89.5	407#	380#
Infections of the nervous system	53	44.8	35.8	42.5	17.2
Pachymeningitis	45	31.4	33.2	42.5	34.5
Cerebral malformations	29	13.5	0	0	175

The very high rates for neurosyphilis in these types are discussed in Am. J. Psychiat., 1928, 8, 425.

TABLE 4. COMPARATIVE INCIDENCE OF RESPIRATORY DISEASES.

Disease	Cases	Schizoid	Paranoid	Cycloid	Epileptoid
Active tuberculosis	212	286	25.5	30.3	77.7
Tuberculosis (over 50)	86	223	21.2	37.8	71.3
Healed tuberculosis	132	68.7	143	109	103
Lobar pneumonia and influenza	107	88.2	69.0	66.7	86.1
Bronchopneumonia	470	287	352	534	475
Pulmonary infarction	55	23.9	56.3	48.6	60.5
Abscess & gangrene	48	35.9	33.2	36.4	43.1
Bronchiectasis	38	25.4	33.2	24.5	34.5

TABLE 5. COMPARATIVE INCIDENCE OF GASTRO-INTESTINAL DISEASES.

Disease	Cases	Schizoid	Paranoid	Cycloid	Epileptoid
Peptic ulcer	30	17.9	27.6	48.5	0
Carcinoma of stomach	21	12.0	25.5	18.2	0
Intestinal tuberculosis	93	127	10.2	12.1	17.2
Hernia, all types	32	33.4	20.5	36.4	17.2
Intestinal gangrene	27	25.4	23.5	0	8.6
Foreign bodies	17	16.4	5.1	6.1	25.9
Chronic colitis	36	37.4	10.2	30.3	17.2
Cirrhosis of liver	42	20.9	46.0	42.5	25.9
Chronic cholecystitis with or without stones	232	127	266	176	121
Diabetes mellitus	13	12.0	7.7	12.1	0
Hemorrhagic pancreatitis	21	12.0	30.7	6.1	0
Biliary passages, Primary carcinoma	13	3.0	23.0	6.1	8.6

TABLE 6. COMPARATIVE INCIDENCE OF UROGENITAL DISEASES.

Disease	Cases	Schizoid	Paranoid	Cycloid	Epileptoid
Nephritis, ac. & chr.	98	26.9	143	121	34.5
Arteriolar sclerosis	20	6.0	23.0	36.4	8.6
Pyelonephritis	53	34.4	48.5	60.7	8.6
Urinary lithiasis	22	7.5	38.3	12.1	0
Cystitis	69	50.8	57.0	66.7	34.5
Prostatic hypertrophy	95	60.8	175	108	38.9
Prostatic carcinoma	22	4.1	49.1	45.1	12.9
Uterine fibroids	120	307	321	444	205
Ovarian cysts	32	108	66.1	74.0	51.2
Urogenital malformations	22	23.6	7.7	6.1	17.2

TABLE 7. COMPARATIVE INCIDENCE OF ENDOCRINE DISEASES.

Disease	Cases	Schizoid	Paranoid	Cycloid	Epileptoid
Pituitary tumors (small)	29	13.5	20.5	30.3	60.5
Goitre	86	59.7	76.6	84.8	25.9
Persistent thymus (20%)	45	16.4	10.2	12.1	190
Adrenal hemorrhage	19	14.9	15.3	6.1	17.2
Adrenal adenomata, and hypernephromata	37	29.9	23.0	30.3	25.9

TABLE 8. COMPARATIVE INCIDENCE OF PRIMARY MALIGNANT DISEASE.

Cases	Schizoid	Paranoid	Cycloid	Epileptoid
125	50.8	175	133	17.3

tion of the personality of the individual. This is particularly important in the proper diagnosis of obscure cases and the proper handling of outspoken cases. I refer especially to the differential diagnosis between tuberculosis and carcinoma when the physical signs are equivocal, and to the prognosis and treatment of individuals who show outspoken psychologic traits. A few case reports might be cited.

REPORT OF CASES

Case 1. White male, aged 66 years, admitted to St. Elizabeth's Hospital April 21, 1884, died April 24, 1926. Clinical diagnosis: hypertrophied prostate; mental diagnosis: dementia precox.

The patient became ill January, 1926, with fever, cough and expectoration. He was prostrated, but the cardiac sounds were of fair quality and the blood pressure was 164/78. Breathing was shallow, with moist râles posteriorly. A diagnosis of acute bronchitis was made, and the patient improved under appropriate treatment. It was noted later that urination was difficult. Rectal examination revealed a greatly enlarged prostate which was treated by massage, but a sudden rise of temperature on April 15th after two weeks of such treatment led to further examination. The prostate was greatly enlarged, drawn out to the sides, but not indurated as in malignancy. The median furrow was not felt. The catheter could not be passed. The seminal vesicles were not indurated. The urine contained a heavy trace of albumin and a heavy deposit of pus. The blood urea was 66 mg. per 100 cc. On April 22nd a suprapubic incision was made and a retention catheter introduced. Urinary suppression followed, however, and the patient died two days later. At necropsy a massive tuberculous abscess of the prostate was revealed, with active lesions in the right kidney and early ones in the left. In addition there was acute tuberculous pneumonia.

The psychiatric record of the patient shows that he was admitted at the age of 24 in an excited state. Throughout his stay in the institution he was inaccessible, dull, apathetic; at times he was entirely mute, or exhibited peculiar mannerisms and postures, and took no care of his personal needs. This schizoid type of individual shows great susceptibility to tuberculosis and little to prostatic hypertrophy. Proper evaluation of the patient as an individual might have been the means of avoiding the dissemination of the tuberculous infection through massage of the tuberculous prostate.

Case 2. Colored male, aged 46 years, admitted to St. Elizabeth's Hospital July 29, 1908, died January 22, 1926. Clinical diagnosis not made; mental diagnosis, paranoid precox.

About January 14th the patient began to complain of pain in the abdomen, but showed no loss of weight or appetite. He refused to allow satisfactory examination, saying to the physician: "Go away, I will have nothing to do with you." There seemed to be nothing requiring surgical intervention, and the temperature remained normal. About midnight on January 21st he cried out with a sudden sharp pain in his abdomen, which he said was as if something had burst within him. He was in severe shock, sweating, with some abdominal distension. An enema failed to produce relief and codeine was administered to relieve him of pain until operation could be performed. He died at 8:30 a. m. Necropsy revealed an annular carcinoma of the descending colon with rupture of a greatly hypertrophied wall several centimeters above, the whole peritoneal cavity being filled with semifluid frothy feces.

The psychatric record of the patient indicated that he was resistive, suspicious,

non-cooperative, occasionally noisy and dangerously assaultive. He believed that people were working against him, and he hated everybody. It is possible, had he permitted satisfactory examination, that the nature of the process would have been evident, but the character of the man should have awakened us to the possibility of carcinoma before the catastrophe occurred.

Case 3. White male, aged 60 years, admitted to St. Elizabeth's Hospital March 19, 1928, died June 27, 1928. Clinical diagnosis, coronary thrombosis; mental diagnosis, manic-depressive psychosis.

On June 20th, while out walking with other patients, he became suddenly ill, with subnormal temperature, pain in the chest, rapid pulse and vomiting. For the next few days there was slight fever and leucocytosis with abdominal distention but no tenderness or rigidity. The symptoms soon subsided, the vomiting did not recur and he became quite comfortable. He got out of bed, ate heartily, received visitors. Seven days later he dropped dead in a convulsion.

The earlier history indicated that the patient was arrested while directing traffic at a busy intersection. He had always been somewhat peculiar. At the age of 30 he became restless, moved about the country with his family, leaving job after job in quick succession. He was suspicious, meddlesome, complaining about his associates. In 1916 he had a period of depression and ceased supporting his family. Again in 1918 came a period of excitement that lasted for months and in 1927 a period of depression in which he became antagonistic, morose, suspicious. This resolved into the excited phase during which he was arrested. This type of individual, with his press of activity, his talkativeness, his meddlesomeness, is the one par excellence subject to circulatory disasters, and such was found to be the case at necropsy. The posterior wall of the left ventricle was reduced to a pulpy hemorrhagic mass; the surface was coated by a thin layer of fibrin, and there were thrombi in the left ventricle. Probably the coronary occlusion had occurred a week before death, and the terminal convulsion may have been due to ventricular fibrillation. The correct diagnosis was made in this case. The point is, however, that it could almost have been predicted on the basis of his behavior, and preventive measures instituted.

Case 4. White male, aged 80, admitted to St. Elizabeth's Hospital September 19, 1924, died October 3, 1926. Clinical diagnosis, chronic myocarditis, bronchopneumonia; mental diagnosis, senile dementia.

Upon admission the patient was quite feeble, and spent most of the time in bed. His progress was uneventful, however, until August 12, 1926, when he became noticeably weaker and began running slight fever with rapid pulse and dyspnea. He recovered from the attack of acute bronchitis and did fairly well for nearly two months when the temperature rose to 104, the pulse to 140, breathing was very difficult, and he was evidently in extremis. The heart was slightly enlarged to the left without murmurs or irregularity, the arteries were sclerosed. Moist râles were heard over both lungs, without friction rubs, bronchial breathing, or change in the percussion note. The abdomen was scaphoid, no organs were palpable and no tenderness was present. The examination of the nervous system was negative. The patient died in less than 24 hours.

At necropsy there was found arteriosclerosis with myocardial fibrosis and dilatation. The left pleural cavity was obliterated by a thick, almost cartilaginous, pleura, white, rather translucent, with trabeculae of fibrous tissue running through it. There were miliary nodules over the peritoneum, along the course of the lymphatics, and at the base of the mesentery. Similar nodules were found in the liver. The diagnosis at the table was flat tabular carcinoma of the pleura with metastasis. The microscope revealed tuberculosis.

Mentally the patient was confused, inattentive, disoriented. He showed marked loss of memory, talked in a rambling incoherent manner, lived in a dream world where the imaginary voices and visions were more real to him than the external world, and had no insight into his condition. The type of behavior placed him in the schizoid group, although the cause of the psychosis was arteriosclerosis and advanced age. Proper evaluation of his personality, together with

recognition of the manifestations of tuberculosis as seen in old age, should have aided me in making a correct diagnosis at the time of necropsy.

The data given in the tables apply to psychotic people. If they apply as well to mentally normal individuals the physician's estimate of the patient's constitution and personality will aid him in his diagnosis and prognosis. The patient represents a unit, and to derive the most accurate information one must regard him as such, not as a collection of organs and an assembly of functions. Little of this is now heard in the clinic, dominated as it is by the laboratory and by instruments of precision. It must be recognized, however, that disease is the reaction of an individual to external or internal circumstances. Study of the individual as a whole will throw a light upon the fundamental nature of all his reactions. If he "lies down" when his boss upbraids him he is apt to lie down under the assault of the tubercle bacillus figuratively and literally. If he jokes about severe financial losses, he is apt to stand up well under severe hemorrhage or severe diarrhea. It is a question of "backbone." If he responds to a blow on the jaw by pinning his opponent's shoulders to the floor, his endothelial leucocytes may react to the insults of invading streptococci by penning them into a periapical focus in the same jaw. If he reacts to his discharge from a job by building up a series of delusions that destroys his insight, he also responds to physical injury by building up a new-growth that destroys his life. "Cancer," says Lewis, "is paranoia at the cellular level."

These ideas are not altogether fanciful. The basis for them is expressed in the tables. Too long has the clinician paid attention to the seed of disease and lost to sight the soil upon which it is implanted. The parable of the sower is more important to us in this day and generation than it was when Osler first uttered it, since it is being forgotten in the frenzied search for specifics and pathognomonics.

The Psychological Panel

How recognize psychologic types?

Some are instantly apparent; some are recognized in the first ten minutes; some not in ten hours or in ten years. It is in the ten-minute class that the foregoing data will be found most applicable. A few well-directed questions in regard to the past and social history of the patient will orient the examiner. These may be worked in without doing violence to the scheme of recording the history, and without distracting the patient. For instance:

Do you drink alcohol? How much? *How does it affect you?*

The answer to the last question will be much the most interesting, since the true character of the man is often made evident when the veneer of civilization and culture is dissolved off by alcohol. The cycloid is sociable, gay; the schizoid solemn, sleepy; the paranoid morose.

Have you had any accident? Any family reverses? *Do you blame other people or yourself when things go wrong?*

The schizoid blames himself, grieves in silence, hides his disgrace and waits for something to turn up. The para-

noid blames his boss, or believes his fellow-workers or some influence caused his reverse. As a school-boy, the teachers had it in for him. The cycloid is downcast, tells everybody of his hard luck, relaxes in alcohol or other diversion, then pulls himself together and runs for office or gets a job selling stock.

Have you had any venereal disease? Are you strongly sexed? *What is your attitude toward the opposite sex?*

The cycloid is often promiscuous, enjoys the society of the opposite sex. The schizoid idealizes or dislikes them; the paranoid holds them in contempt or shuns them (note the low rate for neurosyphilis). Yet all may be happily married.

How do you get along with members of your sex?

The cycloid has a large circle of friends, makes them easily, takes them at their own appraisal; the paranoid makes few, is suspicious though at times almost gullible; the schizoid is dependent upon one or two, or prefers to be by himself.

What is your occupation? *What hobby do you ride?*

A patient's avocation is frequently a guide to his character. Constructive arts appeal to the cycloid; reading and nature study to the schizoid; sports to the cycloid; his business to the paranoid. The collecting mania is seen in the schizoid and paranoid. Psychoanalysis explains the hoarding of old and useless things as a socially acceptable sublimation of anal eroticism. Wohlegemuth speaks of the psychoANALists.

Are you worried over your business or finances? *What would you do if somebody gave you a hundred thousand dollars?* (This is a favorite question of Howland's.)

"Go round the world," says the cycloid, "buy a house; buy a car; get married." "Pay my debts; invest it; buy a lot of clothes; take a course," says the schizoid. "See my lawyer," says the suspicious paranoid, or "buy out the boss."

Are you easily depressed? Are you suspicious of others? Are you easily embarrassed? Are you religiously inclined?

Ten minutes sympathetic questioning of a coöperative patient will bring out sufficient material to give the examiner a lead to the manner in which the patient reacts to his environment. Then an appraising glance at the physical make-up of the patient may supply corroboration. The cycloid is apt to be thick-set and ruddy, the schizoid pale and thin, the paranoid well-developed muscularly, the epileptoid often disproportioned. Such a comparison of head, trunk, and limbs in the same individual will tell more at a glance than will a host of separate measurements. Again the individual must be regarded as a unit.

Somewhere in his notes the physician should enter his impressions concerning the personality make-up of his patient, and should recall these impressions in his summary of the case, and in his diagnosis, prognosis and therapeutics. When he does that he will rise above the stage of treating a disease and find himself treating the patient. The best psychologist is the best physician.

Conclusions

Life is a constant interplay of action and reaction. External influences impinge upon the individual and he reacts to them more or less specifically, in a manner determined by his organismic pattern. If he reacts in a particular manner to a psychologic insult, he will react in an analogous manner to a bacterial or to a chemical insult. Some correlations between personality reaction type and disease susceptibility are indicated. By a study of the personality of the patient some insight may be gained into the manner in which he reacts to other situations. Diagnosis and prognosis, as well as therapy, depend upon knowing the patient.

Gastro-intestinal Troubles That Now Go Undiagnosed*

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FOR years I have been distressed at my inability to label with the usual textbook tags a considerable number of the patients who complain of indigestion or abdominal distress. Some of the fault is doubtless mine but much of it I feel sure is due to the fact that as yet the textbooks have not supplied me with all the tags I need. "Authorities" are notoriously conservative, and particularly so when it comes to the classification and naming of disease. For years the surgeon with his exploring knife has been playing havoc with old ideas; he has shown that cholecystitis and duodenal ulcer are common and gastritis and gastric ulcer are rare, but years go by before the writers of books surrender to the new diseases the pages so long devoted to the old.

For a generation we have known that the stomach is not the essential organ of digestion and that organic disease of its walls is rare, and yet, so great is the conservatism of publishers that they persist in labeling their textbooks on gastro-enterology with the old title of "Diseases of the Stomach." The commonest single cause of severe indigestion is probably disease of the gallbladder but if one turns to a "System of Medicine" and looks for cholecystitis where one would expect to find it, in the volume on "Diseases of the Stomach," it will probably not be there. Why? Because in the old scheme of things the gallbladder belonged with the liver, and there it still is, treated in a more or less stepmotherly way. There one can find much about gallstones but little if anything about the problems which daily confront the modern consultant. Where except from his own experience and the perusal of contemporary journals can he learn anything about the real significance of what the pathologist rather grudgingly calls "slight cholecystitis," or where can he learn something that will help him in handling the patients who after cholecystectomy continue to have colic or symptoms suggestive of biliary tract infection?

A SEARCH FOR NEW SYNDROMES

Obviously, if we who are puzzled are ever going to get any new information we must dig it out for ourselves. We must study disease in our

*Read at the Fourteenth Annual Clinical Session of the American College of Physicians, Minneapolis, Minnesota, February 10, 1930.

patients and not in our books. In the years in which I have practiced medicine I have watched several new syndromes emerge from the group of so-called neuroses, and I see no reason why the process should not continue. Twenty-five years ago such troubles as duodenal ulcer, early cholecystitis, and chronic ulcerative colitis were rarely recognized; twenty-five years from now those of us who are still alive will be wondering how it was that in 1930 we could have failed to see that certain of our cases fall into definite groups, and that the symptoms of the patients were too severe to be accounted for on the basis of a neurosis.

Obviously, then, we must go looking for new diseases; but where? Explorers do not hunt for new land in the Mediterranean; they conserve their energies by hunting only about the Poles or in New Guinea or Tibet. Where should we be hunting? In the hope of throwing light on this question, I took from my files the records of 500 patients (227 men and 273 women) who in the latter half of 1925 in San Francisco consulted me in regard to indigestion or abdominal distress. I chose these cases for several reasons: one, that I had studied them personally; another, that in many instances I had known the patient for years, or long enough to become well acquainted with the problem involved, and another, that I wished first to get some idea of the experience of an ordinary consulting gastro-enterologist. Later with the help of my colleagues I hope to analyze more of the strange problems which are fairly common in a large institution like The Mayo Clinic.

Difficulties in Classification

As soon as the records were read and abstracted, it became obvious that in many cases it would be impossible for anyone to make a single clear-cut diagnosis. It is comparatively easy to do this when all the complaints of the patient are clearly related to the presence of some serious lesion such as peptic ulcer or cholelithiasis, but how is one to classify the indigestion of a nervous, psychopathic woman with migraine, constipation, mucous colitis, urticaria, hypertension, gallstones, uterine fibromyomas, and a husband with whom she cannot live in peace. I am thinking of an actual case in which the first therapeutic experiment was the removal of the gallstones. As this produced only temporary improvement the foods which were causing the urticaria and possibly some of the attacks of mucous colitis were next detected and eschewed. Again there was a little improvement but the woman continued to be prostrated by severe attacks of headache, abdominal pain and vomiting. To make peace in the family the husband then left home but this didn't help much. Finally as I came to know this woman I saw that her troubles were due almost entirely to the severe migraine; the stones were impressive to look at but apparently they had been silent and had had little to do with the case. I have therefore listed her record under the heading of migraine. The point I wish to make is that if I had lost track of the woman in the first few months after the oper-

ation when she and I thought it had cured her, I could have classified her case as one of cholelithiasis.

Perhaps the strongest impression which I have gained from the study of these 500 case histories is that today the poverty of our knowledge in regard to the more unusual types of gastro-intestinal disease is due largely to the fact that we physicians so often see but one short episode in the course of a long-continued chronic disease. Let us say that a woman has wakened at 2 a.m. with nausea, vomiting, and abdominal pain; a few days later the digestive tract appears by every test to be normal, so a few suggestions are made as to the diet, perhaps a little rest is prescribed, and the patient departs. Was it an attack of food poisoning or a manifestation of some serious disease? Six months later when another attack comes this time with an accompaniment of jaundice, melena, blood in the urine, or choked discs, the patient goes perhaps to another physician and the ignorance of the first remains unchanged.

For a number of reasons, then, the proper classification of many of the cases listed in table 1 is impossible. The grouping which I have attempted, although obviously imperfect, will, I think, be helpful in that it gives some idea of the extent of the problem which needs now to be attacked. The groups are made up of persons with: (1) definite disease of the gastro-intestinal tract; (2) symptoms suggesting such definite disease; (3) disease in organs outside the digestive tract; (4) generalized diseases; (5) nervous troubles and constitutional handicaps, and (6) poorly understood symptoms such as constipation, diarrhea, and flatulence.

Definite Disease of the Gastro-Intestinal Tract

The first point to be noted is that a definite diagnosis of disease of the digestive tract was made in 175 or about one-third of the cases. The commonest single cause of indigestion seemed to be cholecystitis, with or without stones. About half of the seventy-seven patients were operated on and the diagnosis confirmed. It was interesting to see how many of these patients were suffering also with hypertension, heart disease, fibromyoma of the uterus, and arthritis. As F. H. Carber recently pointed out to me, these diseases which accompany cholecystitis have great significance not only because they keep the patient from recovering completely after cholecystectomy but because they shorten life.

The next frequent cause of trouble was duodenal ulcer, and after this the next was subacute or chronic appendicitis. The diagnosis of appendicitis was made conservatively and in almost every case the criteria were first, that the patient had had typical or fairly typical attacks, and second, that if operation was performed recovery was definite and lasting. As will be noted, gastric ulcer and gastric carcinoma were rarely encountered.

I have included in this group of patients with organic disease four cases of infestation with *Ameba dysenteriae* and two of heavy infestation with *Giardia lamblia*. Such parasites can often be found in the stools of patients but my impression is that in

most cases they have little if anything to do with the production of the symptoms complained of. Hopefully one prescribes the appropriate drugs, the cysts disappear, but too often the patient returns with the same old troubles. For one success I have had many failures. I sometimes tell patients that in my estimation their few intestinal parasites are like a few fleas: undesirable of course, and nice to part with, but not the cause of their neurasthenic symptoms.

A number of authorities deny that giardiasis ever produces symptoms but in the two cases listed in table 1 the recovery after treatment was so striking that the inference is that the organisms were pathogenic. There was one additional case of great interest in which an athlete suddenly found himself, in the middle of the training season, too weak to run. As I had just cured his sister of years of indigestion by ridding her of Giardias, his stools were examined and found to be full of cysts of *Ameba dysenteriae*. While these were being removed, the stools became filled with cysts of Giardia and when those were also wiped out, the boy was soon winning races again. Because ameba dysenteriae is the more definitely pathogenic organism of the two I have, in table 1, classified this case as one of amebiasis.

I must admit, of course, that the sister's trouble may have been due to an unrecognized amebiasis which was cured by the salvarsan used to destroy the Giardias, but this is the difficulty which dogs the steps of everyone who would attempt to bring order out of chaos in the field of gastro-intestinal pathology. I can remember how in my medical youth I read with interest articles on such topics as "The indigestion of the menopause." Today I would not even look at them unless the writer could assure me that in each case he had, by exploration at laparotomy or necropsy, ruled out the presence of organic disease, particularly in the biliary tract.

There is many an article on, let us say, gastric hemorrhage in chronic appendicitis which would never have been written if the author had spent more time watching necropsies. I do not mean to imply that there is no such thing as gastrorrhexis in appendicitis; the point I am making is that anyone who elects to write about such conditions should know how frequently silent peptic ulcers are found at necropsy, and how difficult it is for a surgeon at operation to make sure that there is no lesion on the posterior wall of the duodenum.

Two cases listed in table 1 under the title of chronic mesenteric lymph-node disease interest me greatly because I believe they represent one of the new syndromes which I now want to see studied. The subject has recently been discussed by Freeman. The symptoms in a number of my cases were attacks of nausea and diarrhea, with abdominal soreness, sometimes fever, and usually much prostration and nervousness. I think it probable that future research will show that there are several causes for the large nodes. One of them may be infection with *Brucella abortus*. In some of my cases tuberculosis was suspected and in others it was ruled out.

There is another condition to which I would like to call attention and this is inflammation and widening of the anal ring. Among the 500 cases there were three in which I deemed this to be the basis for abdominal discomfort, constipation and flatulence. Certain it is that as soon as a proctologist cleared up the inflamed crypts, fissures, and small fistulas, the symptoms all disappeared and the bowels moved normally again.

There were two interesting cases in which cholecystitis was probably part of a generalized infection with some organism of low virulence. In one there was fever and arthritis which lasted for two years. Some features suggested tuberculosis but its presence could not be demonstrated. In the other patient the organism was a streptococcus of viridans type which, during the course of years, invaded one organ of the body after another. I believe that many of the curious abdominal troubles that are associated with tenderness of the liver, symptoms suggesting cholecystitis, occasional slight rises in temperature, and sometimes arthritis, are due to smouldering generalized infection with organisms of low virulence.

Patients with Symptoms Suggesting Organic Disease

This group is to me the most interesting of all because it is the one in which research is most needed. It comprised 115 patients or over one-fifth of the total number. Many were incapacitated or were suffering so much that the trouble could hardly be ascribed to nervousness. In sixty cases the clinical picture resembled that of cholecystitis, but for a number of reasons, the diagnosis remained in doubt. In some, important symptoms were lacking, or the patient was so querulous or so self-contradictory that the history could not be taken at face value. In others the gallbladder concentrated well with the dye test, or at operation the organ did not appear to be diseased. In a few the gallbladder was thought at operation to be diseased and was removed, but later, doubt crept in because the patient failed to improve.

Such cases in which after operation on the gallbladder the patient continues to suffer with the old symptoms of bloating, colic and perhaps even jaundice are very trying to the clinician. If stones were found at the operation or if the gallbladder was only drained, it often pays to operate again to look for more stones or to remove the gallbladder, but if the organ never contained stones, if it was removed, or if there is no jaundice, there is little to be hoped for from another laparotomy.

In many of these cases it seems to me that the symptoms must be due to the persistence or recurrence of infection throughout the biliary tree, and a tendency to spasm in various parts of the digestive tract. So far as I know no one has as yet offered any explanation for the troublesome flatulence complained of by these patients. Many of them doubtless continue to suffer because they are neurotic, or because they are handicapped by hypertension, migraine, or the nervous upsets that attend the menopause.

The diagnosis of peptic ulcer is not always easy. In eight cases the roent-

genologist saw a defect in the duodenum but either the symptoms were indefinite or they failed to respond to the usual treatment for ulcer. In a clear-cut case everything points the same way: symptoms, high acids, cap defect, relief with two hourly feedings, lesions at operation, and cure after gastro-enterostomy, but in the puzzling cases there are strange contradictions in the evidence. Thus in one instance the symptoms were characteristic of ulcer, the roentgenologist saw a defect in the outline of the gastric shadow, and at operation the surgeon felt a thickened area which he excised. The pathologist, however, could not, in the tissue which he received, find any ulcer, and the patient continued for years to suffer with hunger pain.

Eight persons suffered pain and distress in the region of the appendix, but, again, I could not always be sure of the diagnosis even when operation brought relief. The difficulty was that I soon lost track of the patient, and a cure lasting a few months failed to impress me. What happened after that would have interested me more.

There were sixteen patients in whom the only diagnosis possible was the meaningless one of abdominal pain. Perhaps in some of them a real diagnosis could have been made if I had been able to observe the patient long enough or if I could have seen an acute attack.

A troublesome group of cases is that in which after appendectomy the patients continue to complain of pain and distress in the right lower quadrant. In some of them I suspect that the trouble is due to a persistence of low grade infection either in the walls of the ileum and cecum or in the glands draining this region. A few of these patients have a sort of hunger pain which occasionally is relieved by food, perhaps because eating helps the terminal ileum to force its contents past a spasmodically contracted ileocecal sphincter.

In one such case in which for several years the patient had been incapacitated by pain and vomiting, and in which on roentgen-ray examination I found marked ileal stasis and some gastric stasis, Dr. C. H. Mayo short-circuited the ileocecal sphincter by making a new opening between the ileum and the ascending colon, and obtained a perfect and lasting result. Spasm of the ileocecal sphincter probably serves as the basis for at least one of the syndromes which some day will be recognized and dignified with names.

I have placed in this group of puzzling cases those with diverticulitis of the colon because although it is easy to demonstrate diverticula it is not always so easy to say that inflammation is present in some of them and that this inflammation is responsible for the symptoms complained of. I have seen cases in which the discovery of harmless diverticula so fully satisfied the clinician that he failed to look further and thus missed the really important lesion in gallbladder or stomach.

There are a number of cases in which I strongly suspect that the indigestion of later life is a sequel of peritonitis in childhood or youth: peritonitis which left adhesions and loci of minor resistance.

I suspect that there are cases in which early cirrhosis or other disease of the liver with resultant disturbances of the portal circulation must produce indigestion and abdominal distress, but as yet the syndrome has not been recognized. Probably, in most cases, if any diagnosis is made it is that of cholecystitis.

I have listed two cases under the heading of gastritis or enteritis but I have placed a question mark after these diagnoses because if a necropsy could have been performed it might have been impossible to demonstrate changes in the mucosa. One case was that of a woman who was well until she ate some sandwiches at a picnic. Shortly afterward she suffered with intense pain in the epigastrium, with a burning feeling there, and globus. In the weeks that followed she lost 22 pounds in weight. In the other case, a similar upset followed an attack of "influenza."

I have encountered a number of instances in which after an acute attack of "food poisoning" or more probably of infection of the digestive tract with pathogenic organisms, symptoms of indigestion continued for weeks and months until the amount and quality of the food was restricted and the digestive tract was given a rest. Recent studies by Childrey at the Mayo Clinic have shown that if the intestine is overburdened and overwhelmed on one day it will not digest well on the next. Under such conditions a vicious circle may easily be started and maintained unless, for a few days, the work of the bowel is made easy.

Diseases in Organs Outside the Digestive Tract

In four cases the abdominal pain complained of appeared to be due to arthritis of the spine, with involvement of nerve roots. Such spondylitis, with a history of previous lumbago, wry neck, or sciatica, was encountered in twenty-four other cases but in them the relation of the disease to the abdominal discomfort was not so clear.

In many of the women it seemed to me highly probable that the tendency to indigestion was related in some way to the presence of defective ovaries, old pelvic inflammation, a retroverted uterus, or uterine fibromyomas. I have always had the impression that there is a relation between cholecystitis and pelvic disease but it would take a careful statistical analysis of necropsy records to prove it. Of one thing I am certain and this is that it will repay the gastro-enterologist to consult frequently with a good gynecologist.

In one case a puzzling pain in the hypogastrium which had been ascribed by several physicians to diverticulitis, inguinal hernia, and appendicitis was relieved as soon as posterior urethritis was discovered and treated. In another case the distress which had been thought to be digestive in origin was relieved by the removal of a large prostate.

Some physicians may be surprised to find that I have listed only two cases in which the cause for the indigestion was assumed to be dental infection. In many instances I suspected that severe pyorrhea was an important factor but other causes for the symptoms could always be found, and doubt remained in my mind. In one case the

indigestion and nervous breakdown of a husky farmer was traced to osteomyelitis in the mandible; in the other, the patient, a big lumberjack, had for several months been going from physician to physician seeking in vain for relief of symptoms which suggested the presence of peptic ulcer. No one had been able to demonstrate such a lesion, and the usual Sippy treatment did not give relief. On general principles I had two badly decayed molars removed, and to my surprise the man returned in a few days to say that his symptoms were gone, his strength had returned, and he was off to the mountains again.

Generalized Diseases

In twenty-six cases it seemed to me that the complaints of the patient could best be accounted for by the presence of hypertension. I do not mean that hypertension ordinarily produces indigestion; often in the most severe forms it does not, but occasionally it causes the victim to seek the advice of a gastro-enterologist because anginoid pain, extrasystoles, paroxysmal tachycardia or the distress occasioned by a failing heart are thought to be due to the accumulation of gas in the stomach.

A number of elderly patients who for some time had been treated for indigestion but who really had a failing heart were miraculously cured as soon as I induced them to move away from San Francisco's steep hills. In elderly persons with hypertension, attacks of dizziness with nausea and even vomiting must often be due to tiny thromboses of the vessels of the brain or to transitory shut-offs in the cerebral circulation. I have seen physicians make a diagnosis of "acute indigestion" when a little examination of the patient would have revealed a slight hemiplegia.

It would seem that some of the indigestion and flatulence of persons with arteriosclerosis and hypertension must be due to disturbances in the blood supply to the bowel and to other abdominal organs, but as yet I know of no way of telling when such disturbances are present and responsible for the symptoms complained of. Research along these lines should be profitable.

In four of the 500 cases the cause of the indigestion was an unrecognized pulmonary tuberculosis. In three there was hyperthyroidism, and in one myxedema. In one case the subsequent history showed that I had been dealing with the beginning stages of a rapidly fatal leukemia, and in another I strongly suspected that I was face to face with the early symptoms of pernicious anemia. In still another I feared that I was dealing with some lesion of the suprarenal glands. The woman had been heavily exposed to tuberculosis in childhood; there were calcified nodes near the left kidney, and the skin was suspiciously dark. At intervals of one or two weeks she would suddenly be prostrated by an attack of nausea, severe diarrhea, sometimes abdominal pain, and always that shaky nervous feeling which is experienced after an overdose of epinephrin. Unfortunately, I never had a chance to study the blood pressure in an attack. She recovered after a long course of heliotherapy.

Nervous Troubles and Constitutional Handicaps

In thirty cases I have used as a diagnosis the term "fatigue neurosis". It is fairly satisfactory in that it brings to mind the picture of a man or woman who has broken down under the strain of overwork, long hours, heavy responsibility, no vacations, and perhaps insomnia. It is unfortunate that nowadays so many of these patients, instead of being given the rest which they so sadly need, are driven "over the edge" into a nervous breakdown by ill-advised operations for the removal of teeth, tonsils, or appendix. Even when definitely indicated, such operations should, I think, be deferred until the patient has had a chance to rest.

When there is no history of overwork and yet the patient is obviously hypersensitive, apprehensive and on edge I use the term "nervousness." Many persons resent this word because they think it implies that they are excitable, flighty, foolish, or in some way culpable. They forget that a person who is outwardly calm may be inwardly seething, tense, and frightened.

I have coined the word "temperamental indigestion" to describe the troubles of certain men and women, often of one of the Mediterranean races, who get along well enough until some annoyance sets them off into an emotional debauch. The term "anxiety neurosis" is useful to describe those cases in which, after the sudden death from cancer of a relative or friend, or after a visit to a pessimistic or tactless physician, or after the appearance of symptoms which are thought to be due to the return of an old well-treated syphilis, the patient becomes terror-stricken.

I usually place in a special category those persons who are living under terrible strain and who are eating their meals to the accompaniment of bitter words. Perhaps the wife is insanely jealous, or the husband has been untrue and a divorce is pending, but whatever the reason, there is little that the physician can do until peace is restored.

I believe there should be a separate classification for the women who vomit or regurgitate immediately after meals. The problem is not one of indigestion because the food which is retained is handled comfortably, and operations on the stomach or bowel are worse than useless. In one case recently studied by R. L. J. Kennedy and me the difficulty was not in the stomach at all but in the left leaf of the diaphragm where a violent tic-like contraction appeared as soon as food was taken.

In table 1 I have grouped together those persons who seemed to me to be psychopathic, "constitutionally inferior," asthenic, or deficient in ovarian function. Gastro-enterologists would do well to remember that for every insane person confined in an asylum there are several queer, poorly adjusted relatives at large, and many of these complain of indigestion, "autointoxication," depression, or weakness which is out of all proportion to the amount of physical abnormality that can be found. In these cases the physician will do well to focus his attention on the weakness and the inability to stand up to the strain of life

and not on the aches and pains in the abdomen.

I think the term "constitutional inferiority" is a useful one with which to picture the thin, nervous, flabby, weak-backed, poorly sexed girl who, if she had been born a kitten or a puppy would not long have escaped drowning. Some "asthenics" could doubtless be placed in this group but I reserve for them a less opprobrious term because so many, though physically handicapped, drive onward with such keen, active, idealistic brains that they succeed in doing much of the constructive work of the world. I have never been able to decide whether they are tired because they were originally endowed with too little strength, or simply because they spend what they have so recklessly in an effort to do three men's work in a day.

I place in a separate group those women who show a masculine type of distribution of hair on face, breasts, and abdomen, and who have defective pelvic organs, painful and scanty menstruation, and sexual anesthesia. For the sake of brevity I continue to label this polyglandular defect with the term "hypovarianism." Many of them suffer with nervous indigestion, mucous colitis, and constipation.

Years ago I would have classified a number of the thin congenitally handicapped patients as victims of enteroptosis but now that I know how commonly this condition is found in healthy persons, I doubt the wisdom of ascribing symptoms to it. Some persons doubtless feel better while wearing an abdominal support but this does not convince me that enteroptosis is a disease. The good which these women often derive from a sojourn in a sanitarium is due probably not so much to the fat which they put on as to the rest which they get. I think I would as willingly ascribe symptoms to a large navel, to a hooked nose, or to flaring ears, as to a mobile cecum or to a redundant sigmoid flexure.

I fear that many physicians do not yet know the danger of operating on patients with severe migraine. The attacks of nausea, vomiting, prostration, and severe abdominal pain may strongly suggest the presence of cholecystitis, but the expert will continue to question the patient until he is sure that there is never any indigestion between attacks, and never an attack without headache. If the cerebral disturbance always comes first he will know that operations must not be done. I have seen patients with this disease who have submitted cheerfully to one useless operation after another; usually first appendectomy, then cholecystectomy, then gastro-enterostomy, and finally the taking down of the gastro-enterostomy. Surgeons must learn that in these cases it is useless to open the abdomen because the disease is not there. It is probably up in the brain from whence there spreads out down the vagi or splanchnics a nervous "storm" similar to that which produces the abdominal crises of tabes. Even when gallstones are found their removal may have no effect on the course of the disease. It is possible that some of the cyclic vomiting and other poorly explained digestive upsets of children represent "migraine equivalents".

Mucous colitis is another condition which accounts for much unnecessary

opening of the abdomen. At operation I have looked at the colon in some of these patients; in others I have sectioned it, and studied the slides under the microscope, and I have been unable to find anything wrong. I have seen the surgeon remove half of the colon and cure the constipation which was thought to be the cause of the mucous colitis, and still the patient continued to lie on a couch with a hot water bottle over the place where the cecum used to be.

It seems to me obvious that the disease is not a true colitis. There exists first a congenital predisposition; second, a hypersenstiveness to many types of stimuli; and third, perhaps some local source of irritation, as in the pelvic diseases of women. Research is much needed in order to learn what happens to intestinal secretion and absorption during an attack.

In some cases, perhaps in many more than we now suspect, abdominal distress is due to hypersensitiveness of the colon to certain foods, or perhaps to substances which are excreted through its wall. Spectacular cures can sometimes be obtained when the offending foods are detected and avoided, and in a few cases I have even seen headaches disappear.

The difficulty in recognizing these cases of so-called "intestinal allergy" is increased by the fact that urticaria is not always a part of the clinical picture. The points that should arouse suspicion in the mind of the medical attendant are that the patient or one or more of his or her relatives are subject to hay fever, asthma, or eczema, and that the attacks of abdominal distress are associated with irritability of the bladder, with pain in the muscles and joints, and perhaps with hives and headache.

For a time I wondered if this type of sensitiveness might be the cause of mucous colitis, but observations made by intelligent patients have convinced me that although "intestinal allergy" may at times give rise to an attack of "colitis" the two conditions are sufficiently distinct so that those who suffer with both diseases can tell them apart. A woman who has learned to avoid all the foods that used to poison her tells me that she still has attacks of mucous colitis whenever she gets a cold, when she becomes greatly fatigued, or when she loses her temper.

I do not like the way in which many physicians now apply the term colitis to every case of spastic constipation in which the haustration of the colon is a little irregular. I think the term should be reserved for those cases in which, with the sigmoidoscope, one can see that the mucous membrane is definitely inflamed or ulcerated.

Symptomatic Diagnoses

In nineteen cases the only diagnosis made was constipation. There are many patients in whom flatulence and indigestion can be relieved if only the lower end of the colon can be emptied without insult to the rest of the bowel. When the colon is highly sensitive, purgatives and rough diets are equally injurious, and often then the best solution of the problem can be found through the use of enemas of warm physiologic saline solution.

I dislike the usual textbook division of constipation into spastic and atonic varieties because I doubt if there is any

basis for it in fact. I think it more helpful to divide the cases into: (1) those due to nervous strain; (2) those in which the stasis is rectal; (3) those in which there is stagnation in a large cecum; (4) those in which the cause is probably cholecystitis, pyloric obstruction, or chronic appendicitis; (5) those in which the food is insufficient in amount or in residue; (6) those in which there is disease about the anus or in the pelvis; (7) those in which the disturbance is due largely to neglect of the calls of nature, and (8) those in which it is due to carcinoma of the bowel or to diverticulitis.

There were thirty-six cases of diarrhea. As Cabot long ago pointed out it is seldom that one can, even with the help of all modern diagnostic methods, hazard an explanation as to the cause of diarrhea. When ova and cysts of pathogenic organisms cannot be found, when gastric acidity is up to standard, when the bacterial flora is within limits of normal, and the colonic mucosa unbroken what is one to say?

I have classified one patient as an air-swallower because he was so unusually good at it, but when I fitted this tag to him my responsibility did not cease; I had still to explain why he wanted to belch, and why he kept up this fatiguing practice hour after hour. In many cases it is a tic or habit spasm dependent on exaggerated reflexes which are mediated by a hypersensitive, tired, over-worked brain and cord, but in others the cause is to be found in a diseased gallbladder which upsets the normal rhythm of the gastric waves, or in a hypertension with its attendant failing heart.

The last case on the list was an interesting one. It was that of a very tall thin young woman who had learned the trick of noisily swishing water and air from one end of her long stomach to the other. When it was pointed out to her that this was not a disease but only an accomplishment of doubtful social value she lost interest in it.

Minor Diagnosis and Interesting Symptoms

It will be remembered that as I abstracted the records of the 500 cases I made note in each instance, not only of what I considered to be the principal diagnosis but also of other less important ones, and even of some of the outstanding symptoms. When these were listed the resulting table was so large that I thought it best to abridge it and present here only the more important and interesting items.

That the clinician should have a thorough understanding of cholecystitis and all its attendant problems will be seen from the fact that this condition was diagnosed definitely in eighty cases and its presence was suspected in ninety-five more. The tremendous importance of nervousness in gastroenterological practice can be seen from the fact that in at least 109 cases it had to be considered as a factor in the causation of the patient's illness. Hypertension is another important condition. It was considered to be the most important one in twenty-six cases but it was pronounced enough to be mentioned in another sixty. Disorders of the heart were found in thirty-one. Diarrhea was mentioned in the histories of seventy-two patients. Seventeen persons had a low basal metabolic

rate and one was definitely hypothyroid.

Duodenal stasis was noted in four cases but in none of them was it considered pathogenic. Diverticula of the duodenum were found occasionally but in one of the cases did the condition appear to be responsible for symptoms.

I was puzzled by four women who complained of a disturbance in the sense of taste. In some it was salty, and in others it was acid or bitter. In some the disturbance was unilateral, but what it was and how to cure it I never could learn. I read widely but found nothing that gave me light.

Conclusions

It should be obvious from this study that further research is needed, particularly in the group of cases in which the symptoms are severe enough to suggest the presence of organic disease of the digestive tract but in which the nervousness of the patient, the way in which the history varies with repeated telling, the absence of certain important features, the absence of roentgenologic signs of disease, and perhaps the inability of the surgeon to find anything wrong at operation makes a satisfying diagnosis impossible. In some of these cases the symptoms may possibly be due to disease in the brain, in the cord, in the nerves supplying the viscera, or in the blood vessels going to them.

There is no question that disease of the brain and cord can simulate acute cholecystitis or appendicitis. Supposed pathologic changes have been found in the nerves and ganglions connected with the digestive tract but it is so difficult to stain nervous tissue and then to interpret what is found that I do not know what value to put on the reports so far available.

Some of the necessary advance in knowledge will probably come through better follow-up studies of patients with strange symptoms; others will come when we physicians have a better understanding of the physiology and bacteriology of the bowel, and others will come through more careful and minute studies of the tissues obtained at necropsy.

I think it should be obvious also from this study that no one can be a good gastro-enterologist until he has first become a good clinician with a wide knowledge of disease of every kind, in every part of the body.

Summary

This paper represents an analysis of the diagnosis made in 500 cases of indigestion with abdominal discomfort. The study was made with the idea of mapping out the areas in which clinical research is most needed.

In 175 cases, or in one out of three, there was organic disease of the digestive tract. In fifty-two cases the cause for the symptoms was found in organic disease outside the digestive tract. In ninety-five cases the patients were congenitally handicapped or nervous and the symptoms seemed obviously to be functional in origin.

The most puzzling group was made up of 115 cases in which the symptoms were so severe as to suggest the presence of organic disease. The syndrome often resembled that of cholecystitis but frequently it suggested the presence of ulcer or appendicitis.

Cholecystitis is the most common single cause for severe indigestion.

Organic disease of the stomach is rare; it was found in only twelve cases.

Among the subjects considered in the paper are: the significance of infestation with intestinal parasites, chronic enlargement of the mesenteric lymph-nodes, inflammation of the anal ring, mild recurring septicemia, spondylitis, pelvis diseases of women, migraine, mucous colitis, nervous vomiting, intestinal allergy, constipation, and diarrhea.

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TABLE 1. PRINCIPAL DIAGNOSIS MADE IN 500 CASES

Definite disease in the digestive tract	Cases
Cholecystitis and cholelithiasis	77
Duodenal ulcer	42
Appendicitis, subacute and chronic	17
Gastric ulcer	6
Carcinoma of the stomach	2
Fibromyoma of the pylorus	1
Hernia of the diaphragm	1
Carcinoma of the pancreas	2
Carcinoma of the colon	1
Carcinoma of the rectum	1
Recurrent intestinal obstruction	3
Chronic ulcerative colitis	4
Malfunctioning gastro-enterostomy	1
Pyloric obstruction, cause not determined	1
Septicemia with cholecystitis	2
Trauma to the abdomen (blows and strains)	2
Chronic mesenteric node disease	2
Infection with giardia	23
Infection with *Amoeba dysenteriae*	4
Inflamed anal ring	3
Rectal prolapse	1
	175

Suspected organic disease of the digestive tract	
Syndrome suggesting cholecystitis	60
Syndrome suggesting peptic ulcer	13
Syndrome suggesting appendicitis	8
Gastritis or enteritis	2
Tuberculosis of the cecum	1
Post-cholecystectomy disease	4
Post-appendectomy disease	4
Abdominal pain, cause unknown	16
Cirrhosis of the liver	1
Diverticulitis of the colon	5
Sequelae of old peritonitis	1
	115

Organic disease outside the digestive tract	Cases
Pyosalpinx	1
Posterior urethritis	1
Prostatitis with urinary retention	1
Pyelitis	2
Arthritis of the spine	4
Osteomyelitis of the jaw	1
Dental infection	1
Carcinoma of the lung?	1
Gonorrhea (one man and one woman)	2
	14

General disease	
Hypertension	26
Failing heart	1
Pulmonary tuberculosis	4
Hyperthyroidism	3
Myxedema	1
Leukemia	1
Pernicious anemia?	1
Familial jaundice	1
	38

Functional and Indefinite	
Fatigue neurosis	30
Nervousness	7
Marital infelicity	2
Temperamental indigestion	1
Nervous vomiting	2
Hysteria	1
Psychopathy	9
Constitutional inferiority	6
Asthenia	2
Hypovarianism	2
Migraine	12
Mucous colitis	7
Sensitive colon	1
Allergy	13
Constipation	19

	Cases		Cases
Alternating constipation and diarrhea	1	Aerophagy	1
Flatulence	5	Gastric borborygmus	1
Diarrhea	36		158

TABLE 2. PRINCIPAL AND MINOR DIAGNOSES TAKEN TOGETHER*

Cholecystitis	69	Pulmonary tuberculosis (active or healed)	10
Cholelithiasis	11	Tuberculosis suspected	5
Duodenal ulcer	43	Hypertension	88
Gastric ulcer	5	Heart disturbances	27
Appendicitis	33	Paroxysmal tachycardia	4
Cholecystitis suspected	90	Hypothyroidism, usually moderate	18
Cholelithiasis suspected	5	Migraine	25
Duodenal ulcer suspected	22	Migraine questionable	5
Ulcer suspected	9	Headache	11
Gastric ulcer suspected	2	Arthritis, cervical	3
Appendicitis suspected	24	Arthritis, spinal	23
Post-appendectomy pain	6	Arthritis, generalized	9
Duodenal stasis	4	Sciatica	2
Diverticulum of the duodenum	3	Constipation	43
Allergy	26	Diarrhea	72
Allergy suspected	5	Flatulence	16
Amebiasis	12	Strange taste in mouth	4
Ameba coli infection	7	Mucous colitis	8
Inflamed anal ring	10	Mucous colitis questionable	4
Calcified nodes in the abdomen	9	Nervous troubles	109
Pelvic disease in women	43	Nervous vomiting	4
Menopausal upset	6	Psychopathy	11
Fibromyoma of the uterus	30	Asthenia	5
Hypovarianism	20	Constitutional inferiority	13
Nasal sinusitis	5		
Tabagism	3		

*A patient whose case was classified in table 1 as one of cholelithiasis may have had in addition duodenal ulcer, hypertension, and pelvic disease. In table 1 the case was listed under one heading; here it is listed under four.

Arteriosclerosis in Diabetes*

By Elliott P. Joslin, M.D., *Boston*

EVERY other diabetic now dies of arteriosclerosis and the percentage of such cases has been rapidly rising. In the Naunyn Era it was 15 per cent, in the Allen Era 26 per cent, in the first half of the Banting Era it was 41 per cent, but for the last 4 years in 781 fatal cases in my own series it has grown to 50 per cent. In diabetes the percentage mortality from arteriosclerosis is one-third greater than for the population as a whole, if we take Massachusetts for a criterion, because in this state it is responsible for 37 per cent of the total mortality.

Three years ago in Cleveland the relation of arteriosclerosis to diabetes was discussed.[1] In the intervening period new evidence in my own series of diabetic cases has been accumulating, and reference will be made to some of the statistical, clinical, X-ray, pathological and chemical findings.

The scope of the investigation of the clinical material includes all true diabetic cases seen by me between 1894 and 1930 and of these 97 per cent have been traced. The causes of death have been verified by personal notes received from the family physician in most of those instances in which our information came from a death certificate. Had it not been for aid received from the Metropolitan Life Insurance Company through its Medical Director Dr. Augustus S. Knight, I could have hardly assembled the data, much less tabulated it. The tabulation has been under the supervision of Dr. Louis I. Dublin and under the immediate charge

*Read at the Minneapolis Meeting of the American College of Physicians, February 11, 1930.

Table 1. Percentages of Deaths of Diabetics Due to Arteriosclerosis and to Diabetic Coma in Each of the Important Eras of Treatment.

	Total Deaths	Deaths from arterio-sclerosis; Percent	Deaths from coma; Percent	Average duration of diabetes
Naunyn—1894-June 1914	342	15	61	4.7
Allen—June 1914 to August 1922	805	26	42	5.4
Banting—August 1922 to 1929,* Total	979	44	17	8.1
August 1922-Dec. 31, 1925	505	40	22	7.6
January 1, 1926-1929*	474	48	11	8.7

*Includes deaths up to anniversary of treatment in 1929 except among cases treated prior to August 7, 1922, who are traced to August 7, 1929.

of Mr. Herbert Marks. For purposes of tabulation and to guard the identity of the patients case numbers and not names of patients have been sent on transcribed cards to the office of the Metropolitan Life Insurance Co.

Rise in Arteriosclerosis Explained. The most important reason for the rise in arteriosclerosis as the cause of death is the fall in the mortality from coma. This has dropped from 61 per cent in the Naunyn Era to 11 per cent in the 781 cases who had died the last 4 years. Even youth escapes coma today and of our 10 fatalities among 412 children during the last 19 months only five were due to coma. A second reason for the increased prevalence of arteriosclerosis is the greater length of life of the diabetic. Although exceptionally he may not be born in the arteriosclerotic zone, as two-thirds are, he is now living into it. My average fatal case now has survived diabetes 8.7 years and for the fourth and fifth decades of onset the duration is 12.7 and 11.1 years respectively. These two reasons, the reduction of coma mortality and the prolongation of duration of the diabetic's life, have advanced the average age at death so much that about 1 year each year for the last 16 years has been added until it is nearing 60 years in contrast to 44 years in the Naunyn Era. For my 34 fatal diabetics at the New England Deaconess Hospital last year it was 63.5 years as contrasted with the average age at death for all patients in the Deaconess proper which was 54 years and in the Palmer Memorial branch of the Deaconess, a hospital largely for chronic diseases, which was 59 years. The diabetic is now dying old and this complicates the arteriosclerotic problem. How old the average diabetic is who dies is best realized if the average age at death of diabetics is compared with the average age of death for the entire population in the registration area for the United States. In 1920 this age was 41.9 years.

Localization of Arteriosclerosis. The localization of the arteriosclerosis has been studied for all fatal cases. The heart was the most frequent site, 19.1 per cent of the total mortality, next the legs 13.2 per cent as evidenced by gangrene, far less the brain, 7.2 per cent, and least of all the kidneys, 4.7 per cent. Sex made no essential difference in the distribution of the arteriosclerosis; indeed in females it was but slightly less frequent in the heart, 17.4 per cent, but it was considerably more common in the brain 8.8 per cent.

If one compares the localization of the arteriosclerosis for the different epochs, the Naunyn, the Allen, and the Banting, it will be found that the percentage of deaths due to arteriosclerosis in the brain remains constant while that of the heart and peripheral arteries increases at the expense of the kidneys, the importance of which possibly may have been over rated in the Naunyn Era.

Age of Onset of Diabetes in Relation to Arteriosclerosis. The age of onset of the diabetes is important in any study of arteriosclerosis, because it can be assumed that if any of us die of old age arteriosclerosis will be the cause. Table 4, which brings out the relation of arteriosclerosis to the decade of onset, contains 8 cases who died of this complication although the

TABLE 2. INCIDENCE OF ARTERIOSCLEROSIS AS A PRIMARY CAUSE OF DEATH AMONG 979 DECEASED DIABETIC EX-PATIENTS BY TYPE OF ARTERIOSCLEROSIS, BY SEX AND BY AGE AT ONSET AUGUST 7, 1922-1929*.

Sex; age at death	DEATHS						PERCENT OF ALL DEATHS AT SPECIFIED AGES				
	Total	Arterio-sclerosis All types	Apoplexy	Arterio-sclerosis and gangrene	Cardiac and angina pectoris	Nephritis	Arterio-sclerosis All types	Apoplexy	Arterio-sclerosis and gangrene	Cardiac and angina pectoris	Nephritis
Both Sexes											
All ages	979	432	70	129	187	46	44.1	7.2	13.2	19.1	4.7
Under 30	96	2	—	—	2	—	2.1	—	—	2.1*	—
30-39	53	5	—	—	4	2	11.3	—	—	7.5*	3.8*
40-49	78	16	2	4	8	2	20.5	2.6	5.1	10.3	2.6
50-59	248	107	17	23	53	14	43.1	6.9	9.3	21.4	5.6
60-69	349	202	27	71	86	17	57.9	8.0	20.3	24.6	4.9
70-79	134	84	21	26	28	9	62.7	15.7	19.4	20.9	6.7
80-89	21	15	2	5	6	2	71.4	9.5	23.8	28.6	9.5
Males											
All ages	514	224	29	69	106	20	43.6	5.6	13.4	20.6	3.9
Under 30	60	1	—	—	1	—	1.6	—	—	1.6*	—
30-39	27	5	—	—	3	2	18.5	—	—	11.1*	7.4*
40-49	43	10	1	2	6	1	23.3	2.3*	4.7*	14.0*	2.3*
50-59	127	60	10	13	32	6	47.2	7.9	9.4	25.2	4.7
60-69	178	98	12	39	41	6	55.1	6.7	21.9	23.0	3.4
70-79	67	43	5	14	20	4	64.2	7.5	20.9	29.9	6.0
80-89	12	7	1	2	3	1	58.3	8.3*	16.7*	25.0*	8.3*
Females											
All ages	465	208	41	60	81	26	44.7	8.8	12.9	17.4	5.6
Under 30	36	1	—	—	1	—	2.8	—	—	2.8*	—
30-39	25	1	—	—	1	—	4.0	—	—	4.0*	—
40-49	36	6	1	2	2	1	16.7	2.8*	5.6*	5.6*	2.8*
50-59	121	47	7	11	21	8	38.8	5.8	9.1	17.4	6.6
60-69	171	104	16	32	45	11	60.8	9.4	18.7	16.3	6.4
70-79	67	41	16	12	8	5	61.2	23.9	17.9	11.9	7.5
80-89	9	5	1	3	3	1	88.9	11.1*	33.3*	33.3*	11.1*

*Because of the small number of deaths from arteriosclerosis, percentage distribution not significant.

*Includes deaths up to the anniversary of treatment in 1929 except among cases treated prior to August 7, 1922, who are traced to August 7, 1929.

TABLE 3. LOCALIZATION OF TERMINAL LESION IN DEATHS OF DIABETICS DUE TO ARTERIOSCLEROSIS IN EACH OF THE IMPORTANT ERAS OF TREATMENT.

Site of Terminal Lesion	Percent of All Deaths Due to Arteriosclerosis		
	Naunyn Period	Allen Period	Banting Period
Brain	17	18	16
Kidneys	23	14	11
Heart	37	41	43
Peripheral arteries	23	27	30

onset of their disease was in the first three decades. These few cases would not appear significant when we are dealing with so many, were it not that 6 of them occurred in the last 4 years when young diabetics are living longer. Reference will be made to them later. Similarly, as showing the change in the direction of the wind, in the fourth decade of onset the arteriosclerosis has risen markedly and in fact has doubled between the early and late periods of the Banting Era. Thus, of 46 deaths in those whose disease began between 30 and 40 years arteriosclerosis was responsible for 41.3 per cent. Such a percentage would not be expected for the population as a whole. Of course these data are misleading to this extent in that they are based upon age at onset and they become less striking when we realize upon the average the patients lived 12.7 years after onset before death came.

Arteriosclerosis Increases with Duration of Diabetes. With increasing duration of the diabetes arteriosclerosis rapidly rises as a causative factor of death. If the duration is less than 5 years, arteriosclerosis leads to 30 per

TABLE 4. INCIDENCE OF ARTERIOSCLEROSIS AS A PRIMARY CAUSE OF DEATH AMONG 979 DECEASED DIABETIC EX-PATIENTS. BY AGE PERIODS AT ONSET.

Age at Onset	Whole Period — August 7, 1922-1929			Aug. 7, 1922—Dec. 31, 1925			1926-1927		
	Total deaths	Deaths from arterio-sclerosis	Percent of total deaths	Total deaths	Deaths from arterio-sclerosis	Percent of total deaths	Total deaths	Deaths from arterio-sclerosis	Percent of total deaths
All ages	979	432	44.1	505	203	40.2	474	229	48.3
0-9	19	1	5.3	14	1	7.1	5	—	—
10-19	46	2	4.3	30	—	—	16	2	12.5
20-29	60	5	8.3	44	1	2.3	16	4	25.0
30-39	94	28	29.8	48	9	18.8	46	19	41.3
40-49	236	110.	46.6	118	57	48.3	118	53	44.9
50-59	295	165	55.9	139	74	53.2	156	91	58.3
60-69	180	94	52.2	89	49	55.1	91	45	49.5
70-79	47	25	53.2	22	11	50.0	25	14	56.0
80-89	2	2	100.0	1	1	100.0	1	1	100.0

*Includes death up to anniversary of treatment in 1929 except among cases treated prior to August 7, 1922, who are traced to August 7, 1929.

Site of Terminal Lesion Brain C 7t

Because of the small number of deaths from arteriosclerosis, percentage distribution not significant.
*Includes deaths up to the anniversary of treatment in 1929 except among cases treated prior to August 7, 1922, who are traced to August 7, 1929.

cent of the deaths, if 5-9 years to 44 per cent, if 10-14 years to 63 per cent, if 15-19 years to 60 per cent, and if 30 years or over to 68 per cent. If diabetes originates in an individual between 50 and 59 years old his chances of dying of arteriosclerosis are 2 to 1 if he lives 15 years and still higher if he lives longer. The effect of growing duration of the diabetes upon the arteriosclerosis is more apparent now than a few years ago.

Arteriosclerosis Especially Frequent Among Jewish Diabetics. The influence of race appears to have a definite effect upon arteriosclerosis mortality in diabetes. Thus it is decidedly more prone to be a factor in Jews. Of Jewish deaths 54.2 per cent were due to arteriosclerosis, in contrast to 43

TABLE 5A. INCIDENCE OF ARTERIOSCLEROSIS AS A CAUSE OF DEATH AMONG 979 DECEASED DIABETIC EX-PATIENTS BY DURATION OF DIABETES IN SPECIFIED AGE PERIODS AT ONSET.

	PERCENT OF DEATHS DUE TO ARTERIOSCLEROSIS					
	Duration of Diabetes (In Years)					
Age at Onset	Total	Less than 5	5-9	10-14	15-19	20 and over
All ages	44	30	44	62	60	68
0-9	5	6	—	—	—	—
10-19	4	3	—	—	100	—
20-29	8	—	20	33	—	33
30-39	30	9	6	27	54	81
40-49	47	22	50	52	57	65
50-59	56	37	54	80	67	78
60-69	52	52	47	65	67	—
70-79	53	50	60	67	—	—
80-89	100	100	—	—	—	—

*Includes deaths up to anniversary of treatment in 1929 except among cases treated prior to August 7, 1922, who are traced to August 7, 1929.

TABLE 5B. PERCENTAGE OF DEATHS DUE TO ARTERIOSCLEROSIS AMONG DIABETICS ACCORDING TO DURATION OF THE DISEASES FROM ONSET TO DEATH.

Duration of Disease	Total Deaths	Arterio-sclerotic Deaths	Percent Arterio-sclerotic Deaths
Total	979	432	44.1
Less than 5 years	412	123	29.9
5-9 years	242	106	43.8
10-14 years	177	110	62.1
15-19 years	101	61	60.4
20 and over	47	32	68.1

*Includes deaths up to anniversary of treatment in 1929 except among cases treated prior to August 7, 1922, who are traced to August 7, 1929.

TABLE 6. INCIDENCE OF ARTERIOSCLEROSIS AS A CAUSE OF DEATH AMONG JEWISH DIABETICS COMPARED TO NON-JEWISH DIABETICS.

	JEWS			NON-JEWS		
	Total deaths	Arterio-sclerotic deaths	Percent arterio-sclerotic deaths	Total deaths	Arterio-sclerotic deaths	Percent arterio-sclerotic deaths
Both Sexes	96	52	54.2	883	380	43.0
Males	40	19	47.5	474	205	43.2
Females	56	33	58.9	409	175	42.8

*Includes deaths up to anniversary of treatment in 1929 except among cases treated prior to August 7, 1922, who are traced to August 7, 1929.

per cent for non-Jews. The percentage of arteriosclerotic deaths in Jewish women was 58.9 per cent as contrasted with 42.8 per cent for non-Jewish women.

Arteriosclerosis in the Youthful Diabetic. My concern for the high mortality from arteriosclerosis in my diabetics might appear unwarranted did not I know that this complication is beginning to make itself felt among the group who die under 40, even under 30 years of age. Thus Elizabeth J., Case No. 4079, in the early twenties while driving with her fiancé had a pain in her heart and died in 5 minutes. Premonitory symptoms had been present for a week. Cases 1794 and 2703, when but 33 and 30 years of age respectively, died of angina and coronary thrombosis, as did a case of Anderson[2] at 33, the lesions being demonstrated by post mortems. In fact among the 212 instances of definite angina pectoris in our series my associate Dr. Root will shortly report, there were 7 cases with onset of angina under the age of 40 years and in the decade 40 to 50 years there were 31 patients. Furthermore, one-sixth of all diabetic deaths in patients who contracted the disease under 40 years of age in my group and one-third of all under 50 years of age were due to arteriosclerosis in one or another of its various forms. In Dr. Root's total series of angina cases there was but one case in 12 in which the onset of angina pectoris preceded that of the onset of diabetes. And it is of significance for the etiological relation existing between diabetes and angina pectoris to add that of 209 cases of angina there were as many as 88 females or 42 per cent in contrast to the usually high percentage of males, 75 per cent, in 827 cases of angina pectoris reported by Brooks, Kahn and Borsky, Levine, Kahn and Schmidt.

Even Children Have Arteriosclerosis. As yet one can hardly say they die of it, because so few die. Thus for the last 19 months our mortality among diabetics who have developed diabetes in childhood (under 15 years) has been 1.5 per cent annually. But of these 10 deaths half have been due to coma, the balance being ascribed to nephritis or to sudden, presumably cardiac, deaths, subsequent to infections. Therefore, we are forced to look for evidence of arteriosclerosis among the living children and we have

found it by X-ray through the help of Dr. L. B. Morrison and Dr. Bogan.

Ten of our children show calcification of the arteries of the legs by X-ray, Case Nos. 1616, 2007, 2105, 2353, 2432, 2617, 2757, 2870, 3620, 6416. Nine of these children are still living; one, Case No. 2432, has died having had diabetes 16.5 years and his death certificate read chronic nephritis, arteriosclerosis, chronic colitis and morphinism—and I understand sometime previously he had had gangrene of one toe. The point has been raised that occasionally calicified arteries can be seen in non-diabetic children. This is undoubtedly true and incidentally I would ask if anyone here has a reference in the literature to such cases if he would be kind enough to give it to me. We have controls for our 9 cases of arteriosclerosis in children and these are none other than our diabetic children themselves. Thus in our group of diabetic children to date Drs. Morrison and Bogan have never found arteriosclerosis unless the diabetes has existed at least 5 years and the average duration of the diabetes at which it has been found has been nearer 10 than 5 years. We shall watch with much interest the future of the remaining 8 children whom we know have arteriosclerosis.

Cholesterol. The imortance of cholesterol in diabetes and still more in the etiology of arteriosclerosis in diabetes is still unsettled. Each new series of statistics published advances our knowledge and I look upon the same as new links in the chain of evidence rather than as conclusions. The papers by Hunt[3] and by White and Hunt[4] from our clinic bring out very clearly that hypercholesteremia is amenable to treatment and therefore only of prognostic value in that it shows that treatment is faulty. Dr. Geyelin will go a step further I am sure in an article which will shortly appear. Time is necessary to assess the part played by cholesterol in diabetes and the value of the work of White and Hunt lies in the fact that it gives the data for 100 of our children over a period of 4 years. Among these 100 children the latest analysis for cholesterol showed it to be normal in 80 and to be falling in six more. In four of the nine cases of sclerosis in children it was high, it was high in two of the four cases with tuberculosis, in the patient with a cataract, and of course high during coma and xanthoma. Adolescent children are apt to have high cholesterol values which eventually decrease.

Blood cholesterol values are not found to be high in our adult cases who show arteriosclerosis. The group with the lowest average cholesterol is the group with the greatest arteriosclerosis. Neither can the cholesterol values in our series be definitely correlated with any impending or existing arteriosclerotic process.

The aortae of 100 cases, diabetic and non-diabetic at the New England Deaconess Hospital, have been chemically examined for cholesterol, total lipid and iodine numbers. This work is not yet quite ready for publication.

Definite data upon the diets of the diabetic children and also of adults who show or do not show arteriosclerosis I cannot give. One will look far to find a living diabetic today who has had diabetes for 10 years and is not

taking carbohydrate 100 grams or more. Nearly all my children and practically all my adults take at least that quantity. As we all strenuously urge our diabetics not to overeat and thus get fat, and have given a higher amount of carbohydrate, it has necessarily reduced the content of fat. The future will show the results. So far as I can see our only test for the efficacy of this change will be the advancing average at death of all diabetics. In my group I have already said it has advanced about 16 years in the last 16 years. How long will this go on? It has just occurred to me that the doctors in the United States will serve as a valuable control series for our diabetics. The diabetics, it is true, outnumber them 3 or more to 1, but it should be possible to gather reliable statistics for each group.

Eggs. I do not give my diabetics over 50 years of age more than one egg a day. One diabetic Case No. 3017 with marked arteriosclerosis reduced his consumption of eggs from two to four daily to none at all, and his cholesterol fell to normal. But like so many experiments this was complicated by the rearrangement of his diet made possible by the use of insulin. In a limited group of cases diets rich in eggs did not lead to high cholesterol values. Today we know that restriction in calories helps to reduce cholesterol just as does restriction of fat.

The Retinal Vessels in Diabetes. The condition of the vessels in the eyes of diabetics is being studied by Dr. J. H. Waite and Dr. W. P. Beetham at the Deaconess Hospital. Thus far they have examined 306 patients and their tentative conclusion is that diabetes does promote sclerosis in the ocular vessels. Arteriosclerosis is practically absent in patients under 30 years of age, but present in 95 per cent of all diabetic patients over 50 years of age.

Analysis by duration of diabetes shows small increments in prevalence and degree of sclerosis. For diabetics over 30 years under 1 year duration and counting all four degrees of retinal sclerosis the incidence is 75 per cent, rising to 86 per cent for those over 10 years duration. If only grades 2 and 3 of sclerosis are considered and the age limit raised to 40 years, the percentage for the cases under 1 year's duration is 40, for 1-10 years' duration is 44 and for 10-20 years' duration is 52 years.

Roentgen Ray. Allusion has al ready been made to the incidence of arteriosclerosis in children as demonstrated by examination with the X-ray. Eventually Drs. Morrison and Bogan[8] will report upon a consecutive series of studies which they have made of 1000 of our cases and through their courtesy I can now refer to 298 unpublished instances in which they have looked for calcification of the vessels of the legs. In brief arteriosclerosis is demonstrable in the legs of 50 per cent of these diabetics whose diabetes is under 5 years' duration, and 52 per cent when the duration is between 5-9 years, in 84 per cent when the duration is 10-14 years and in 93 per cent if the duration is above 15 years.

Pathology. The autopsy table shows end results. A monograph upon the Pathology of Diabetes by Shields Warren is now in press and I antici-

TABLE 7. INCIDENCE OF CALCIFICATION OF THE VESSELS OF THE LEGS IN DIABETICS MELLITUS AS DEMONSTRATED BY ROENTGEN RAY.

Duration of Diabetes Years		Decade of Onset of Diabetes								
		0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	Tot.
0-4	Cases	8	14	8	11	11	33	13	5	103
	Calc. percent	0	0	13	36	27	82	100	80	50
5-9	Cases	22	24	13	12	14	23	7	0	115
	Calc. percent	23	25	38	50	71	91	100	0	52
10-14	Cases	0	3	3	11	13	8	0	0	38
	Calc. percent	0	33	33	82	100	100	0	0	84
15-19	Cases	0	0	0	7	7	9	0	0	23
	Calc. percent	0	0	0	100	86	100	0	0	96
20+	Cases	0	0	2	8	6	3	0	0	19
	Calc. percent	0	0	50	88	100	100	0	0	90
Totals	Cases	30	41	26	49	51	76	20	5	298
	Calc. percent	16	17	31	67	75	89	100	80	61

pate with satisfaction the pleasure you will have in its perusal. It is based upon 300 diabetic autopsies, chiefly performed in Boston, but the balance under the supervision of his friends who are some of our most distinguished American pathologists. To such a diabetic collection of autopsies it is the privilege and duty of each physician here to make a contribution. Owing to the kindness of Dr. Warren I can refer to some of his findings.

All of us work hard to improve the status of our diabetics, but I conceive it a reproach upon us all that Dr. Warren is obliged to say that in his series of 300 diabetic autopsies there has been no case with diabetes of 5 years' duration which did not present arteriosclerosis. This cannot be explained upon the ground of the age of the patient, because 80 of the 300 or 264 autopsies were in individuals below the age of 40 years. I am sure the time is not far distant when the medical profession can improve this record and I urge all to watch for an autopsy upon a diabetic whose diabetes is more than 5 years' duration and yet shows no arteriosclerosis and to be the first to put such an one on record for the benefit of us all.

Arteriosclerosis was the cause of death, as shown by autopsy, of 24 per

cent of the deaths in Warren's 300 cases, despite the fact that 80 of the cases were, as said above, under 40 years of age. Of the 23 cases of diabetes of 15 years' duration or over there were 13 or 56.5 per cent who died from arteriosclerosis. Nine of these 23 cases of 15 or more years' duration had gangrene.

The incidence of arteriosclerosis as well as its incidence as a cause of death is recorded in Table 8.

The site of arteriosclerosis in the body which was responsible for the 72 arteriosclerotic deaths is shown in Tables 10 and 11. Arteriosclerosis of the heart was responsible for 43 per cent of these deaths, of the legs for 37 per cent, of the brain, for 11 per cent of the kidneys for 6 per cent and the arteriosclerosis was generalized in 2.8 per cent. Among the patients who had had diabetes 15 or more years and died of arteriosclerosis the heart

TABLE 8. INCIDENCE OF ARTERIOSCLEROSIS BY DECADES AT AUTOPSY.

Age at death in years	Total Cases	Arterio-sclerosis present	Deaths due to arterio-sclerosis	Total incidence of arterio-sclerosis	No arterio-sclerosis
0-10	9	0	0	0	9
11-20	23	7	0	7	16
21-30	19	10	0	10	9
31-40	21	18	1	19	2
41-50	36	29	6	35	1
51-60	66	48	17	65	1
61-70	65	30	35	65	0
71-80	19	7	12	19	0
81+	2	1	1	2	0
?	4	3	0	3	1
Total	264	153	72	225	39

The condition of the aorta was recorded in 226 instances and in but 29 was it free from arteriosclerosis. In 101 instances the arteriosclerosis was of a severe type in contrast to the sclerosis in the kidneys which was sewere but 11 times.

was the cause of death in 69 per cent, the extremities in 23 per cent, and the brain in 8 per cent. In 263 diabetic autopsies there were 54 with infarctions of the heart (Table 12) which is from 3 to 10 times the percentage in large general series of autopsies.

TABLE 9. INCIDENCE OF ARTERIOSCLEROSIS IN 226 FATAL DIABETIC CASES.

Arteriosclerosis of	Slight	Moderate	Severe
Aorta	35	61	101
Kidney	49	47	11

The association of coronary sclerosis with gangrene is very striking. Fourteen cases showed both gangrene and infarcts of the heart, healed, fresh, or both. Thus 25.5% of the 55 cases of gangrene occurred in conjunction with infarcts of the heart.

TABLE 10. ARTERIOSCLEROTIC DEATHS AMONG 300 DIABETIC AUTOPSIES.....

Arteriosclerosis of vessels of	Number	%
Heart	31	43.1
Extremities	27	37.5
Brain	8	11.0
Kidneys	4	5.6
Generalized	2	2.8
Total	72	100.0

TABLE 11. ARTERIOSCLEROSIS AMONG 23 DIABETIC AUTOPSIES.

Duration of Diabetes 15 Years or Over

Arteriosclerosis of vessels of	Number	%
Heart	9	69.2
Extremities	3	23.1
Brain	1	7.7
Kidneys	0	0.0
Generalized	0	0.0
Total	13	100.0

cases who gradually are developing cerebral thrombosis.

Is the high frequency of arteriosclerotic deaths from lesions of the legs to be ascribed to the character of their arteries and the extent of the sclerosis or are these deaths really to be ascribed to trauma and infection? This is a query also raised by Root. No doubt trauma and infection are potent precipitating factors, but Dr. Warren feels from his pathological studies, based upon autopsies and amputated legs of diabetics, that the diabetic sclerosis is distinctive. He elaborates and gives reasons for this in his forthcoming monograph. Every case, however, we can rescue from a death due to gangrene will lessen the importance of the distinction and I do not forget that formerly one of every group of eight diabetics and even in the last four years one in eleven whom I have seen died from this cause.

TABLE 12. INCIDENCE OF INFARCTS OF HEART AND CORONARY THROMBOSIS IN 263 DIABETIC AUTOPSIES.

	Fresh	Healed	Fresh and Healed	Total	Coronary thrombosis without infarction
No. Cases	9	18	7	54	2
Av. age in years	59	63.7	61.1		66
Av. duration in years	11	12.5	12.4		?

The predominance of arteriosclerosis in the arteries of the heart and legs of diabetics is significant. In the vessels here in question the muscularis overshadows the elastic tissue. Incidentally the rarity of endocarditis is striking and so too the prevalence of glycogen in the muscle fibres about the margins of infarcted areas. The low percentage of arteriosclerotic deaths due to the arteries in the brain may be associated with the comparatively few cases of high blood pressure. But I should add that Dr. Root has called my attention to the growing number of

The Future of the Diabetic. It is only a little over a generation ago that one-half of the diabetics succumbed to tuberculosis and I suspect that physicians then considered this end inevitable, but now tuberculosis is no more frequent among diabetics than in the population at large and in 32 years in my group of more than 600 children only 3 of the children have died of it, but 3 are alive with pulmonary tuber-

culosis, and 7 others have tuberculous lesions in other parts of the body. Diabetic coma replaced tuberculosis and in the first half of this present generation 60 per cent of my patients died of it. When in 1922 I reported that in the preceding 7 years my coma mortality had fallen to 40 per cent and that I believed coma preventable, the statement was received with scorn, yet by the end of 1926 you will remember the percentage had dropped to 20 per cent and now for Massachusetts, and incidentally as well for my own series of cases, to 11 per cent. Arteriosclerosis now rules the scene and you and I have seen it grow from 15 per cent to 50 per cent. Must we feel as hopeless about arteriosclerosis today as were some physicians a generation ago about tuberculosis and other physicians half a generation ago about coma? I believe not. It is true we cannot conquer old age, but we can conquer *premature* old age and you and I know that much of the damage which arteriosclerosis produces is preventable. We can fight gangrene this year as we fought coma last year and with success. I am beginning to be ashamed to have one of my patients die of gangrene as I was eight years ago to have one die of coma. I feel that if I make it a rule at a diabetic's first visit to look at his feet before I look at his face, ipso facto, his chances later of dying of gangrene will be almost negligible. I do more. I look at the feet at each visit and tell the patient that I do so, so as to insure him against gangrene. Of course, I realize there are poor risks in all kinds of insurance.

And can you prevent or at least postpone arteriosclerosis of the heart? I also believe you can, because I find that as the years go by each series of the diets of my patients is more and more closely approximating the diets of those in health. At one time my diabetic patients received 25 grams of carbohydrate and the poor cases who escaped coma fell a prey to arteriosclerosis; then the carbohydrate in the diet began to rise to 44 grams, to 63 grams, to 71 grams, to 96 grams and recently I found that comparable diabetics who were discharged without insulin in 1922 with carbohydrate 77 grams now leave the hospital with 147 grams. In fact a survey of all the diabetics on one chance day early this year undergoing treatment at the Deaconess showed they were receiving 125 grams carbohydrate, 63 grams protein and 92 grams fat with glycosuria and glycemia controlled in large degree. If our diets approach the normal, while diabetic symptoms are held in abeyance by insulin and exercise, our diabetics should live about as long as the average individual.

Diabetic children are precocious in height, weight and mentality; the offspring of diabetic mothers tend to be large; our cardiac specialists give glucose for angina pectoris, our surgeons depend upon glucose; when the blood sugar is low, diabetics, and this applies to non-diabetics too, are mentally sluggish and faint. Our blood sugar may rise normally after meals to an extent we should term a diabetic blood sugar if taken before a meal. I wonder if a little hyperglycemia now and then may not be a good thing. Clemenceau with diabetes won the war. Would he have been as vigorous at 77 and as successful without it?

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Unrecognized Hyperthyroidism Masked as Heart Disease*

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THE subject of this discussion concerns itself with a group of patients who suffered from one or another form of heart disease not unlike those customarily seen in any general practice but in whom a previously unrecognized element of hyperthyroidism proved to be a most important factor. The great importance of this undetected burden to the circulation will become clear when the therapeutic results obtained are taken up. At the outset it must be understood that the cases which form the subject of this problem are not the "ordinary" cases of exophthalmic goitre or toxic adenoma. They are not the ordinary ones in the sense that they show no exophthalmos or detectable thyroid tumor, the two presenting features of Graves' disease. They are not the ordinary ones in the sense that they are not recognized as such even at the present time by many of the most competent internists, surgeons, or even heart specialists. They come to the physician complaining of various heart symptoms, may be referred to a heart specialist and be treated for heart disease and therefore hardly ever get to a surgeon because there is no apparent surgical problem involved. They suffer increasing circulatory disability and may eventually die of heart failure and yet had the true nature of the disease been recognized, they might have been cured or at least the condition might have been greatly helped, their suffering diminished and their lives prolonged. It must therefore be quite clear that these cases are to be looked for anew, with somewhat different criteria than those to which we have been accustomed and are not to be confused with the ordinary cases of hyperthyroidism which now show cardiac complications.

Great studies have been made in our knowledge concerning the diagnosis and treatment of thyroid disease during the past ten or fifteen years. With the clinical introduction of basal metabolism determinations, the splendid improvement in the surgical technique and the recent introduction of the preoperative use of iodine, the surgical mortality of operations on the thyroid gland has fallen to a very low level. There is no longer the same fear that attended such operations not so many years ago. It is pleasing to note that this country has had no insignificant part in the above development. We have also witnessed very

*Read before the American College of Physicians, February 10, 1930, Minneapolis, Minn.

dramatic improvement in the state of the circulation in those patients suffering from hyperthyroidism in whom previous to operation, there was gross evidence of cardiac failure. It is with the aim that similar beneficial results might be rendered to heart cases that are at present overlooked that this discussion is directed.

When there is exophthalmos or a definite enlargement of the thyroid gland our attention is immediately called to the diagnosis of hyperthyroidism, no matter what the cardiac signs or symptoms may be. Under such circumstances the diagnosis at least is simple. Proper basal metabolism determinations are made and when correctly interpreted the decision whether the gland is hyperactive or not may be made. But if these two cardinal features are absent and the patient presents himself with symptoms and signs that are at first glance those customarily seen in ordinary heart failure, the possibly of an underlying hyperthyroidism is lost sight of, and the routine administration of digitalis, rest, and the like is instituted. The patient then does not improve but instead slowly grows worse and may eventually die. It is striking, however, that when such patients reach the stage of advanced cardiac failure, they may continue to live months or even years longer than one would have prognosticated. They seem to have an unusual tenacity for life. If any large group of heart patients is investigated in the light of the following discussion, it is very likely that some will be found to be suffering with a certain degree of hyperthyroidism that had previously been unrecognized.

The difficulties in diagnosis become greater still in certain instances, because it is now quite well known that hyperthyroidism may be present in patients suffering already from some other form of heart disease such as mitral stenosis, hypertension, or angina pectoris. It then seems so simple to explain all the symptoms on the basis of the obvious diagnosis, that the additional burden from hyperthyroidism is overlooked. Because the physical findings in the heart in mitral stenosis resemble very closely those found in hyperthyroidism, these two conditions particularly are frequently confused and the possibility of the presence of both simultaneously must be kept in mind.

What are the means employed to diagnose these obscure cases? The most helpful is the general appearance of the patient. The skin of the face is warm, moist, hyperaemic and slightly pigmented, producing a salmon-colored appearance. This often serves as the first clue to direct attention to the thyroid gland. Certain points in the history of the patients are also helpful. They are apt to prefer cold to warm weather, using less than the ordinary protection for their bodies in winter. On direct questioning it may be found that although they do not complain of any gastro-intestinal trouble, they have had short periods of unexplained frequency in bowel movement and attacks of vomiting. Weakness, although generally present is so common in ordinary heart disease that it is not sufficiently distinctive to make one think of hyperthyroidism. The same is true of loss of body weight. Ordinary cardiacs may lose considerable weight

during the course of years, but when hyperthyroidism is present, the loss may be very great and occurs in a shorter time. This loss can occur despite an excellent appetite, although not all the patients, however, have a good appetite. They are apt to feel nervous and in some cases this is displayed by rather alert and quick movements, not customarily seen in patients, otherwise sick with heart failure. In other words the ordinary cardiac with congestive heart failure or with angina pectoris is not generally seen to be moving around unnecessarily in bed whereas these patients may appear hyperactive. Although there is no exophthalmos some may show a peculiar stare to the eyes. It may be ascertained from the past history that they had slight glycosuria off and on and may have been treated for mild diabetes. A tremor of the fingers is generally but not invariably present and the thyroid gland is either not felt at all or is only questionably enlarged. Unexplained perspiration is a striking phenomenon in some cases and many have premature grayness of the hair.

Inasmuch as these patients present themselves primarily with cardiac complaints the heart findings are of extreme importance, especially those that are peculiar to hyperthyroidism. The most characteristic of these is periods of transient auricular fibrillation. There is no other condition in which this occurs so frequently and it would be well to suspect hyperthyroidism in any patient who shows this disturbance no matter what other disease may already exist. The quality of the heart sounds is peculiarly hyperactive and loud. The first heart sound has the same intensity that is seen in well compensated mitral stenosis. Generally with this there is a slight to moderately loud systolic murmur heard at the apex or at the base of the heart and frequently an accompanying vibration or thrill. When the thrill can be timed properly it will be found to occur with systole. Often accurate timing of the thrill is difficult or impossible because of the rapidity of the heart. Under such circumstances the observer is prone to consider it as presystolic because he is prejudging the case as one of mitral stenosis. For similar reasons and because the first heart sound is snapping, the murmur that accompanies it may wrongly be considered as presystolic. Such mistakes have actually been made by most competent observers. I well remember making that same error many years ago in a case that showed no evidence of mitral stenosis at autopsy, but instead an extremely toxic hyperthyroidism. It is easy to see how these conditions can be confused, because they both may have heart failure, rapid heart, auricular fibrillation, a snapping first sound, a thrill at the apex and a systolic murmur. The one critical difference on physical examination is that in hyperthyroidism there is no murmur or thrill in diastole. However, both conditions may exist simultaneously and the diagnosis will then rest on other evidence.

There are further characteristics of the heart that should make one suspect hyperthyroidism. One of these is a failure to obtain slowing of the ventricular rate in a case of auricular fibrillation after proper digitalis administrations. In the ordinary case, unless there is fever, the heart rate

slows to between 60 and 80 on full doses of digitalis. When hyperthyroidism is present, although such slowing occasionally occurs, more commonly it is impossible to obtain a rate under one hundred. That single feature has on occasions been the first intimation that the metabolism would be found elevated. A further finding is the persistence of a regular heart rate of over 90 at rest in bed, in the absence of fever. Most ordinary heart patients with a regular rhythm will show a rate of 80 or under after a few day's observation in bed, even if there is decompensation. Of course many functional heart patients will have a slight tachycardia even in bed, but then if the heart rate is counted while the patient is asleep, it will be found to slow, whereas a rapid tachycardia is apt to persist in hyperthyroidism. It must not be forgotten, however, that active hyperthyroidism may be present with a slow ventricular rate. I have seen several such cases in which the rate was only 70 and one in which it was only 40. In addition to these heart findings the blood pressure readings are of some importance. Although hyperthyriodism itself does not produce any marked elevation in the systolic pressure, the pulse pressure is generally increased and it may be associated with a concomitant true hypertension. The foregoing features of the circulation serve as important aids in the clinical diagnosis of unrecognized cases of hyperthyroidism.

After a suspicion is aroused concerning the possibility of an unrecognized hyperthyroidism by one or more of the above criteria, a careful basal metabolism determination must be made. If this is within normal limits the diagnosis can be dismissed. It is surprising, however, how often it will be found to be elevated in such a group of heart patients. The elevation in the metabolic rate will then need to be confirmed by repeated determinations. If it is persistently elevated one is faced with the question as to how much of the increase might be accounted for by decompensation of the heart itself. Heart failure is some instances is supposed to cause an increase in the basal metabolic rate, but from the experiences with these cases, it would seem that any increase of 40% or more should properly be regarded as due to a hyperactive thyroid rather than to the cardiac failure unless dyspnea is very marked. In fact, rates that were about plus 30% were regarded as such and were proved to be due to the thyroid gland by subsequent microscopic examinations. In the past many have been too quick to ascribe the increase in the metabolism to the heart failure merely because there was no exophthalmos or thyroid enlargement. I am of the opinion that some heart patients who have no more than a plus 20% metabolism but who show the above clinical features have true hyperthyroidism. Metabolism determinations always need to be repeated in order that the element of nervousness, apprehension and the like may not influence the reading. After the customary care has been taken, it then needs to be interpreted in the light of the clinical findings.

When it is decided that the patient has hyperthyroidism he should be kept in bed and started on iodine therapy in one form or another. It

does not seem to matter whether it is given in the form of Lugol's solution, potassium iodide or sajodin. In practically all of the cases of this group, ten drops of Lugol's solution were given three times a day. The treatment is otherwise carried out just as in any heart patient. If auricular fibrillation is present, digitalis in full doses is given. It will be noted in many cases that the ventricular rate will fall on digitalis therapy if iodine is given, whereas before this digitalis failed to produce any appreciable slowing. In general if the rhythm of the heart is regular, digitalis is not given. Diuretics can be used if edema persists, although during the preoperative medical care a diuresis is likely to occur even without the use of diuretics. The diet should be liberal as many of these patients have lost a great deal of weight. Sedatives should be used if necessary to produce sleep. In other words all the measures employed in the treatment of cardiac disease are applicable in this group in addition to the use of iodine. Metabolism determinations should be repeated to note the fall that takes place about five to seven days after the iodine is started. The general plan is to have the operation performed after the metabolism has fallen and the general condition of the patient and the circulation have improved as much as possible. At times under medical treatment the improvement is so marked that both the patient and even the physician might become doubtful as to the advisability of an operation. It is best in most cases, however, to operate just at this time because the improvement is not apt to be permanent and a later time may not be as favorable. In general the optimum time for the operation will be found about ten to fourteen days after treatment was started.

In most of the cases included in this study the operation consisted of a one stage subtotal thyroidectomy performed under general anaesthesia. The anaesthetic used was ether (by mouth or by rectum) or ethylene. The exact choice does not seem to be very important and will vary with the surgeon. It is extraordinary how well these patients tolerate even a one stage operation. The thyroid gland will almost always be found a good deal larger than would have been anticipated from physical examination. Occasionally it will be found to lie almost entirely beneath the manubrium or behind the trachea where it could not have been felt. In all of these cases the pathological examination of the tissue removed showed hyperplasia of the thyroid.

The aim in therapy is to reduce the metabolism to normal. Sometimes this would have been accomplished even before the operation. In such cases surgery helps to prevent a subsequent rise. More often a fall of 20% or more would be obtained on medical care and a further fall after the subtotal thyroidectomy. Usually the return to a normal metabolic level is obtained within one to two weeks following the operation, although occasionally the level continues to fall for several weeks. If the metabolism is still distinctly elevated a month or so after the operation it generally means that certain symptoms of thyrotoxicosis will continue and that enough thyroid tissue had not been removed. Such

cases although much improved, may continue to have auricular fibrillation and it is difficult or impossible to restore the heart to a normal level so long as the metabolism is elevated. A second operation may then be advisable. If the metabolism returns to normal, the auricular fibrillation in most cases will spontaneously change to a normal thyrhm within one to several weeks, but if it should not, then quinidine sulphate should be tried and may regularize the heart. The relief to the heart that results from diminishing the metabolism of the body will show itself in most extraordinary improvement of the symptoms and signs of heart disease. Beside the effect on auricular fibrillation I have witnessed the cure of Adams-Stokes syncopal attacks, of insufferable anginal attacks and the complete and permanent disappearance of intractable general anasarca.

This discussion would surely be incomplete and lose much of its value without reference to specific experiences which illustrate the features taken up above. The results obtained in the following cases (only a few of a much larger group) speak for themselves and merely emphasize the great importance of detecting these unrecognized instances of thyrocardiacs, for in no other group of severe heart cases can such dramatic and beneficial cures or improvement be obtained.

Case 1. F. E. J., a banker, aged 63, came to Boston to seek aid for insufferable anginal attacks. He had previously been treated by various physicians in Buffalo, but was growing steadily worse. He had to stop working because of the great frequency of the attacks of anginal pain. He was sent to me (July 13, 1928) by his son who is a physician, with the purpose of having some surgical procedure carried out, such as a cervical sympathectomy or an alcohol injection for the relief of pain. The attacks began five years before, but during the past six months attacks of severe pain would come without effort and would even awake him from sleep. The attacks were generally relieved promptly by nitroglycerine, but he had to take on the average about 40 pills a day. Latterly there had been some dyspnea with the attacks and fear of death.

Past history and family history were irrelevant.

Physical examination showed very little of importance. The heart was slightly enlarged, there was a soft blowing systolic murmur, both at the apex and the base but no diastolic. The blood pressure was 146/84. The lungs and abdomen were negative and there was no pitting oedema. The peripheral arteries were not remarkable. The urine showed a slightest possible trace of albumin, a few hyaline casts and occasionally a trace of sugar. The phthalein test was 60%. The Wassermann and blood counts were normal.

He had been treated by the ordinary methods before coming to Boston without any relief and while his condition was being studied under what seemed ideal conditions, he was still having 40 attacks of angina a day (10 to 15 during the night). He was at first regarded as an ordinary case of angina pectoris, but because of a recent failure to obtain relief by surgical measures I was at a loss as to what to do. After about one week of observation I became impressed with certain minor features that pointed to a possible hyperthyroidism. He was hyperactive while in bed, his movements being quick and jerky. This is so unlike the ordinary angina patient who prefers to keep still for fear of bringing on an attack. There was a slight tremor of the fingers. The skin was rather warm, hyperemic and moist. There was no exophthalmos, however, and the thyroid gland could not be felt. The heart rate was regular and ranged between 88 and 100. It was then learned that he had lost 15 pounds in eight months, although he had a fairly good appetite.

A metabolism test was therefore done on July 16th and found to be plus 41%. On ten drops of Lugol's solution, three times a day, the readings fell so that on July 21st it was plus 26%, and on July 24th it was plus 4%. With this there occurred a most extraordinary improvement in the condition. The number of attacks fell to only 4 a day and there were none at night. In addition the patient volunteered the following remark "something has happened inside of me, for I have not felt this way in years." A few days later a subtotal thyroidectomy was performed and a small hyperlastic gland was found extending below the manubrium. After the operation the anginal attacks entirely disappeared. He returned to his home and then to work. He had no attacks at all for 6 weeks and since then during the past year he has felt well and would have to take a nitroglycerine pill about once a week when he might hurry in the street or try to climb a hill.

Summary

The extraordinary results obtained in this case can not be ascribed to anything else but the treatment of the hyperthyroidism. Most of the improvement to be sure was obtained temporarily at least by the preoperative use of Lugol's solution. Here a man was restored to his normal health and relieved of the suffering that accompanies 40 attacks of angina a day.

Case 2. R.S., a 63 year old housewife, was first seen in November, 1925. It was known that for at least eight years she had had hypertension. For some years she noticed a choking sensation in the center of the chest upon walking. During the past year there were several major spells of acute pulmonary edema. During these attacks suddenly she would become desperately orthopneic, the chest would fill up with moist bubbling râles, and the whole thing would clear up in fifteen minutes after a hypodermic injection of morphine.

Examination November, 1925, showed systolic blood pressure 220 mm. and diastolic 100 mm. The heart was moderately enlarger, the aortic second sound was ringing, and there was a moderately loud systolic murmur over the precordium. After a month's period of rest in bed the condition improved, and she again became ambulatory.

During the following year, typical anginal attacks developed. These consisted of a squeezing pain in the sternum, with radiation to the left clavicle, ear and arm. These attacks were relieved promptly by nitroglycerine. In May 1928 she was again seen, but the clinical picture was entirely changed. She was now suffering from cough and dyspnea, in addition to the frequent attacks of angina pectoris. It was noted that the skin was moist, warm and hyperemic and a grossly irregular rate of fibrillation was found for the first time. There was no tremor, exophthalmos or thyroid enlargement. The diagnosis of hyperthyroidism was made, which was confirmed by finding the metabolism rate to be plus 74. This was repeated two days later and was found to be plus 50. This patient was suffering so obviously from hypertensive heart failure, auricular fibrillation and angina pectoris and had so little that is customarily regarded as indicating hyperthyroidism, that even after these two basal metabolism readings were made, several members of the visiting staff of the hospital refused to believe that she was suffering from hyperthyroidism.

On June 4, 1928, Lugol's solution was started and several days later the heart rate began to slow. Previously, full doses of digitalis had no effect on the rapid irregular rate. There followed striking clinical improvement. The metabolism fell to plus 35, the heart rate slowed to about 70, the anginal attacks disappeared almost entirely, and the patient felt quite comfortable.

Subtotal thyroidectomy was performed July 6 and microscopic examination of the gland showed mild hyperplasia and fibrosis. Sixteen days after the operation, examination of the heart showed that auricular fibrillation was still present. She was given .2 grams of quinidine three times a day, and in twelve hours the heart became regular. She became ambulatory and entirely free of the anginal attacks.

SUMMARY

This case illustrates the remarkable improvement that occurred in a cardiac patient, by properly treating the latent hyperthyroidism. Apart from the improvement in the more ordinary features of circulatory insufficiency, the striking result here was the specific disappearance of the angina pectoris.

Case 3. M. D. R., a man 52 years old, was first seen in consultation December 27, 1928. He was then complaining of attacks of pain in the right chest, of a mild nature, for the previous two months, but which become quite severe during the last few days. They came both while walking and at rest. During the last day he had several very severe attacks, lasting about one-half hour, during which the pain radiated down both arms to the wrists. During one of these attacks he vomited. He had slight dyspnea for several years, and in 1926 his blood pressure was known to be 120 mm. systolic and 65 mm. diastolic.

Past history and family history were not remarkable, except that during the past six years, there was a gradual loss of 35 pounds in weight.

On examination very little was made out except that the heart sounds were distant, that there was a slight apical systolic murmur. The urine was negative, and the blood Wassermann and blood counts were normal. The blood pressure was 95 mm. systolic, and 60 mm. diastolic. Electrocardiograms were not remarkable. He was sent to the hospital where he remained almost four months. He was treated for angina pectoris, but he continued to have frequent attacks of pain even with careful rest in bed, which were always relieved by nitroglycerine. After he had been observed for four weeks, it occurred to me that the appearance of the patient's skin and face was suggestive of hyperthyroidism. He had no exophthalmos whatever, and the thyroid gland was not palpable. Despite the fact that his pulse rate was around 70, and frequently lower than this, several metabolism tests were done, which were found to be plus 33. During these determinations, the heart rate was 66 and 68. It was felt that these readings together with the moist hyperemic skin, slight hyperactivity of his muscular movements, a definite tremor of the fingers and the insidious loss of weight, all pointed to an active, moderate hyperthyroidism.

The anginal attacks continued unchanged until he was started on Lugol's solution January 31, 1929. Shortly after this there was a marked improvement. The attacks of angina became less troublesome and more infrequent. The metabolism dropped to plus 11, and then on February 16, to plus 6. Because of the obscurity of the problem and the skepticism on the part of some members of the hospital staff concerning the diagnosis of hyperthyroidism, an operation was not performed. He was given therefore four X-ray treatments over the thyroid, but the metabolism was not brought to normal. In fact it rose to plus 36, with return of more frequent attacks of angina. During the X-ray treatment, the Lugol's solution had been omitted. Later it was resumed, and there followed a second improvement, so that the attacks of angina almost entirely disappeared.

Shortly after leaving the hospital, the anginal pains returned. Therefore he was sent into the surgical service for an operation. The surgeons were very timid about operating, but upon urgent request a subtotal thyroidectomy was performed on May 21, 1929. Pathological examination of the gland showed diffuse hyperplasia with involution. Since the operation he has had no pain whatever, he has felt a great deal better and is now ambulatory. The metabolism was plus 20 on May 28 and plus 8 on June 5, 1929.

SUMMARY

This case, had a mild latent hyperthyroidism, which was aggravating an existing angina pectoris. Because of the lack of support and enthusiasm on the part of my colleagues, both medical and surgical, operation was delayed several months and attempts were made to obtain relief by the use of Lugol's solution alone, and later by

X-ray therapy. Operation finally relieved him of anginal symptoms. The diagnosis of hyperthyroidism was here first thought of because of the appearance of the patient's skin, despite the very slow pulse rate.

Case 4. J. A. T., an American executive, was first seen in consultation December 4, 1926. He complained of fatigue and palpitation. For two months he had noticed palpitation of the heart, particularly with exertion. There were no pains whatever. Although previously in excellent health, he recently found himself becoming tired readily. He lost twenty-five pounds of weight in four months, although during this time he had an excellent appetite. There was more than the usual perspiration, and his voice had changed in character. Seven weeks before, he had had an inexplicable attack of diarrhea lasting seven days. He had become somewhat nervous. There was slight dyspnea on walking. For several years he noticed that he frequently felt warm, when other people felt cold. The above history was obtained on direct questioning because the appearance of the patient suggested hyperthyroidism. The outstanding complaints on the part of the patient, when not pressed with direct questions, were palpitation and fatigue. Past history and family history were not remarkable.

On examination, the character of the skin of the face and neck was very impressive. It was warm, moist, hyperemic, slightly pigmented and produced a salmon-colored appearance. There was no exophthalmos or thyroid enlargement. The lungs and abdomen were negative, and there was no peripheral edema. There was no appreciable tremor. The blood pressure was 140 mm. systolic and 80 mm. diastolic. The heart was not enlarged. The action was grossly irregular with an apex rate of 122. The pulse rate was 108. The heart sounds were distinctly hyperactive. There was a short thrill at the apex. No murmurs were heard. The urine was negative except for a rare hyaline cast and the slightest possible trace of sugar.

A diagnosis of hyperthyroidism was made, and the patient was advised to enter the hospital for surgical treatment. To confirm this clinical impression a basal metabolism was done the following morning and found to be plus 35. This diagnosis came as such a surprise to the patient and to his family physician, that further opinions were desired. His doctor was a scrupulously honest and able physician. He knew, as he said later, that if he sent this patient to another heart specialist with the knowledge of the previous diagnosis, he would inevitably be biased in his judgment. He, therefore, directed the patient to tell the second consultant nothing about his experience, nor to mention anything concerning the diagnosis of hyperthyroidism, or of having had a metabolism determination done. At this second consultation, one of the best known heart specialists in this country made the diagnosis of so-called myocardial disease and auricular fibrillation, and advised the administration of quinidine. Upon getting this report, the family physician directed the patient to see the consultant again, but at this time to tell about his first experience. Then a second metabolism was done, which was found to be plus 40, and he agreed that the patient was suffering from thyroid heart disease and should have a thyroidectomy. The above experience is gone into in detail, merely to emphasize the obscurity of the condition, and to show how easily the true nature of the disease can be overlooked, even by a highly trained expert.

The patient spent the next three months hoping to gain improvement on medical treatment, but grew worse. He finally entered the hospital March 26, 1927. He still showed auricular fibrillation, and the metabolism test was plus 38. Ten drops of Lugol's solution were given three times a day. The metabolism fell to plus 23 on April 2nd, and then to plus 8 on April 6, 1927. The heart rate, which previously could not be slowed with large doses of digitalis, gradually came down to a rate of 70, while he was receiving a grain and a half of digitalis, twice a day. A subtotal thyroidectomy was performed on April 7th, and he made an uneventful recovery. About ten days after the operation, the heart spontaneously become regular. During the past three years, the patient has been perfectly well, has re-

gained his weight and strength, and the heart has been normal in every way.

Summary

This patient would be regarded generally as suffering from ordinary myocardial disease with auricular fibrillation. The features which led to the proper diagnosis were the appearance of the skin, the hyperactive quality of the heart sounds, the failure to obtain slowing of the fibrillating heart with digitalis and finally the metabolism determination.

Case 5. L. R., aged 36, entered the hospital, December 8, 1928, complaining of sore throat and attacks of palpitation. For many years he had had many sore throats, and during the past several months had had three attacks of palpitation. A month ago, he had a sudden spell of palpitation, became dizzy and later fainted. His doctor treated him for heart disease with digitalis. About a week later, he had another attack, and this time his physician advised tonsillectomy, which was done December 4, 1928. The day after the operation, a third attack of palpitation occurred.

When he was first seen on the medical service, he was considered to have mitral stenosis of rheumatic origin, and paroxysmal rapid heart action of a type that had not been determined. He had a slight fever of 100 F. The heart seemed slightly enlarged; the action was regular, rate between 70 and 80. The first sound was much accentuated, and there was a rough systolic murmur over the precordium. It was thought by some of the service that a slight presystolic murmur could be heard after effort. The blood pressure was 138 mm. systolic and 62 mm. diastolic. There was no peripheral edema or other evidence of congestion.

When he was seen a few days later, the possibility of hyperthyroidism immediately came up because of the salmon color and hyperæmic appearance of the face. The signs in the heart were typical of mitral stenosis except for the absence of any murmur in diastole. It was further elicited that the patient had lost weight, although he ate fairly well, and that he perspired rather freely. It was predicted that if an attack of palpitation could be carefully observed, it would be found to be due to a transient auricular fibrillation. Electrocardiograms were subsequently obtained during one such spell, which confirmed this diagnosis. There was no exophthalmos, only a doubtful tremor and the thyroid gland was not palpable. The blood examination was negative, the urine showed an occasional trace of sugar up to 0.5%. The first metabolism reading on December 14, 1928, was plus 67%. Subsequent readings ranged around plus 40 to plus 70. The metabolism was markedly elevated despite the fact that the heart rate was generally around 70.

Although I was convinced of the accuracy of the diagnosis of hyperthyroidism, it was difficult to make either the other medical attendants or the surgeon who saw him in consultation, believe this. The elevated metabolism was considered by some to be due at first to the slight fever, and later to the sore throat, tonsillectomy, or to nervousness. Others thought the whole picture was one of mitral stenosis with transient auricular fibrillation. After a month's delay, with the condition remaining unchanged despite digitalization, he was started on Lugol's solution and the metabolism fell to plus 26. A hemithyroidectomy was then performed January 22, 1929 by the surgeon who previously refused to operate because of the uncertainty of the diagnosis. The pathological report of this tissue showed parenchymatous hyperplasia of the thyroid gland.

The day following the operation, as frequently happens, another attack of transient auricular fibrillation occurred. He was discharged shortly after this and was told to return in about six weeks for a second operation, which was performed on March 26, 1929. He again had an attack of transient fibrillation, and then had an uneventful convalescence. The patient improved a great deal subsequently. He gained seventeen pounds, but continued to have occasional attacks of palpitation. The metabolism reading remained constantly elevated at about plus 20, although the pulse rate ranged between 64 and 80. Several months later be-

cause of a maintained elevation in the metabolism, a third operation was performed. After this the metabolism fell to plus 4 and stayed at a normal level. The patient has since returned to work and feels well.

Summary

This is an instance in which the differential diagnosis lay between mitral stenosis and hyperthyroidism. The obscurity of the diagnosis was well indicated by the difficulty in convincing both internists and surgeons that the thyroid was toxic. One unusual feature was the slow heart rate which often ranged between 67 and 70, even when the metabolism was markedly elevated. The appearance of the face, the transient auricular fibrillation, the hyperdynamic character of the heart sounds and the slight glycosuria, all pointed, however, to a latent hyperthyroidism. Three operations were necessary because the surgeon did not remove enough thyroid tissue the first two times.

Case 6. P. C., a 48 year old longshoreman, entered the hospital January 29, 1929, complaining of cough, pains in the chest, weakness and dyspnea. He previously was well and strong, doing hard work until two years ago, when he had a vomiting spell which lasted two weeks. At this time he was studied very carefully at a large general hospital. On discharge the vomiting had ceased, but he was not able to work since then because of weakness. About a month ago he grew worse, began to vomit again, complained of pains in the chest and was very short of breath. There was no previous history of rheumatic fever or chorea.

Examination at this time showed a markedly emaciated man with a rather sickly appearance. The heart was considerably enlarged, the rhythm grossly irregular and the sounds were hyperactive in quality. There was a loud somewhat musical systolic murmur at the apex. No diastolic murmur could be heard. The blood pressure was 140 mm. systolic and 78 mm. diastolic. Numerous moist râles were heard at both bases. The liver was slightly enlarged. There was no exophthalmos, or tremor of the fingers, and the thyroid gland was not palpable. The urine was negative. The blood showed a slight leucocytosis, but otherwise was normal. The Wassermann was negative. The most striking feature was the appearance of the skin, which was quite typical of this entire group of patients. It was warm, moist, hyperemic and somewhat pigmented. The hair was prematurely gray.

During the first week in the hospital the temperature ranged from 99 to 101, and then the fever gradually disappeared. The heart rate ranged from 100 to 120. Many basal metabolism tests were made during the subsequent weeks. At first the readings were between plus 40 and plus 50; later they ranged from plus 25 to plus 35. For three weeks, no specific therapy was administered except digitalis. Although generally he improved, in that the fever, cough and pain disappeared, the heart rate remained rapid, and he lost a few pounds. The day Lugol's solution was started (February 22, 1929) his weight was 87 pounds. During the following three weeks, the heart rate slowed slightly, and the lowest metabolic reading was plus 19.

This case attracted considerable attention and was seen by a great many physicians. For over two months none of the observers would believe that this patient was suffering from thyrotoxicosis. He had been previously studied with extreme care at another hospital and the report from there illustrates the difficulty in diagnosis. This read, "Diagnosis: Fever of unknown origin, ? spinal cord lesion, rheumatic heart disease with mitral stenosis, ? tuberculous peritonitis. This patient from the start has been a complete puzzle to us. He was seen in consultation by the Senior of the following services: Throat, Surgical, Neurological, Psychiatric, Cardiac, Neurosurgical, Orthopedic and Medical; and in no instance was their finding such as to account for the patient's symptoms."

It was not until after clinical improvement followed the administration of Lugol's solution and the subsequent development of a definitely palpable goiter, that the original diagnosis of thyroid heart disease was accepted. He then was given two X-ray treatments over the thyroid gland during March, but the basal metabolism remained moderately elevated (about plus 30). On April 18 a hemi-thyroidectomy was done. Pathological examination of this showed parenchymatous hyperplasia of the thyroid gland. His condition was quite critical a few days after this, but then he gradually improved. After the operation the metabolism tests were normal (minus 6 to plus 8). The patient felt a great deal better and became ambulatory. His weight increased from 87 to 110 pounds. Auricular fibrillation continued, but as weeks went on it was found that the metabolism tended to rise and then remained fixed at plus 25%. A second operation was therefore performed which cured the hyperthyroidism. After this the metabolism remained normal and the auricular fibrillation was made to disappear by the use of quinidine.

Summary

This patient had an active thyrotoxicosis for several years. Although a great many tests and observations were carried out, a basal metabolism determination was not previously done. Prominent heart consultants considered the condition as mitral stenosis. The removal of the cause of the intoxication of the heart was delayed because of failure in diagnosis, although eventually marked improvement resulted from the thyroidectomy.

Case 7. H. S., a man 44 years old, was seen on June 20, 1927, complaining of shortness of breath. For eighteen months previously he had increasing dyspnea on exertion and palpitation. There was no loss of weight. During this illness, he had to gradually restrict his activities. During the last months he was more or less confined to his home, and at various times he was in bed. During the last month he found it difficult to stay in bed and had to sleep sitting up in a chair. Latterly, he noticed a troublesome cough and edema of the feet. On direct questioning, he admitted that for two years he had been nervous. In the past history it was learned that he never had rheumatic fever or chorea, but at the age of twenty a doctor told him he had heart disease. During this eighteen month's illness he was treated by a heart specialist, but steadily grew worse. Although at times he would improve slightly with rest in bed, he never properly responded to digitalis therapy, for the heart rate continued to be rapid. On several occasions he discussed the advisability of consultation, but the cardiologist repeatedly told him that nothing more could be done for him by anyone, and that he would merely waste his money, most of which he gradually spent on medical care.

He entered the hospital June 23, 1927. On examination he showed typical evidence of mitral stenosis, auricular fibrillation and congestive heart failure. The heart was moderately enlarged and was grossly irregular in action, with a rate of 180, and the first sound markedly accentuated. There was a systolic murmur all over the precordium and a definite diastolic rumble at the apex. A short thrill could be felt at the apex which was difficult to time. The bases of the lungs showed evidence of free fluid, more so on the left. The liver was moderately enlarged and slightly tender. There was considerable pitting edema of the lower back and the legs. The thyroid gland could not be felt, and there was a questionable tremor of the fingers. The sclerae showed a definite icteric tint. At first the diagnosis of hyperthyroidism was overlooked, but it was soon noticed that the skin was warm and moist, and there was a slight increased pigmentation of the upper chest, neck and face. A metabolism test was therefore done and found to be plus 61%. The blood Wassermann was negative, the urine was essentially negative, and there was a slight leucocytosis.

Having decided that he had latent hyperthyroidism, he was given Lugol's solution drops 10, three times a day. He was also given digitalis. During the following two weeks a most dramatic improvement took place. The apex rate gradually fell from 180 to 70. The temperature of 100 per-

sisted for one week, and then became normal. A striking diuresis occurred, with a gradual disappearance of all signs of congestion. The consecutive metabolism readings were plus 21, plus 12 and plus 7, during this period. The patient felt much better than he had for two years. A subtotal thyroidectomy was performed on July 9, 1927. The gland was found to be only slightly larger than normal, but the pathological report showed marked hyperplasia, and in one area a small adenoma. Inasmuch as he felt so well before the operation, it is hard to say that he was any better after it. Auricular fibrillation continued, and so he was given quinidine sulphate for a few days, and on July 22, while taking .6 grams, three times a day, the heart became regular. Inasmuch as the fibrillation recurred, quinidine was omitted, and he was kept on constant digitalis. The patient was discharged in excellent condition, and he returned to work, which he has been carrying on ever since.

Summary

This case illustrated very well the difficulties that rise when a patient has both mitral stenosis and hyperthyroidism. The features of one are so much like those of the other that confusion easily results. A cure of the hyperthyroidism merely relieved the heart, already burdened with mitral stenosis, of an added load. The improvement thereby obtained was most extraordinary. Here again a latent hyperthyroidism was detected because of the general appearance of the patient, and the failure to obtain the customary slowing of a fibrillating heart with digitalis.

Case 8. C. K. H., aged 57, entered the hospital May 23, 1929. He considered himself in good health until the middle of April, since when he noticed increasing weakness. A little later he became somewhat short of breath and hoarse. On May 14, he saw his physician with regard to having a tonsillectomy performed. At this time, the doctor found his heart rapid and irregular. He gave him one and one-half grains of digitalis three time a day, and the patient was put to bed. A week before this he developed attacks of fainting. He would almost lose consciousness, would feel a "wave" running over his body, at the same time becoming dizzy. These became more numerous under digitalis. There never was any pain. He lost about five pounds in weight. His appetite had been fair, and he never noticed palpitation. The patient and the family never thought that he was nervous.

When he was seen in consultation on May 21, 1929, it was found that his heart rate was 39 at one moment, and a few minutes later it was 60, at both times quite regular. There was a slight apical and basal systolic murmur. The first heart sound was accentuated. The blood pressure was 112 mm. systolic and 75 mm. diastolic, and the rest of the examination was essentially negative except for the appearance of the patient's face. The skin was warm, moist, hyperemic and distinctly salmon-colored. The thyroid gland could not be felt at all. There was no exophthalmos but there was a distinct tremor of the fingers. The diagnosis at this time was heart block, Adams-Stokes syncope, and probably latent hyperthyroidism. He was sent to the hospital for further study.

In the hospital he was found to have a metabolism of plus 51 on May 24, 1929. The blood pressure was 126 mm. systolic and 64 mm. diastolic. The urine was negative except for a slightest possible trace of sugar on one occasion. The Wassermann was negative. The blood was normal except for a distinct lymphocytosis. The X-ray of the hands showed moderate, diffuse decalcification of the bones. He was put on 10 drops of Lugol's solution, three times a day. Subsequent metabolism readings showed a marked fall on May 25, 1929, plus 27 on May 28, 1929, plus 10 on May 31, 1929 and plus 16 on June 3, 1929. During the iodine medication the patient generally felt much better. He gained about 13 pounds of weight, which was suspected to be partly due to retention of water, although no evidence of edema could be made out. However, he developed frequent syncopal at-

tacks. Before these occurred, a transient attack of auricular fibrillation, with a heart rate of about 100 took place. When the metabolism was at its lowest, the mild spells of syncope were frequent. The heart rate then ranged between 40 and 50, and there were frequent pauses of the heart of three to eight seconds. Electrocardiograms showed this to be due to sinus pauses, and not to any blocking of the beats. In other words, the impulses were actually not formed during these pauses. He was given one milligram of atropine sulphate subcutaneously, but the bradycardia and the pauses continued. On June 1, barium chlorid 30 milligrams, four times a day was started. The heart rate remained slow after this, but the attacks of syncope were distinctly less frequent. On June 3 one cc. of adrenalin was given subcutaneously after which he had a transient spell of auricular fibrillation.

On June 5, a subtotal thyroidectomy was performed, and the gland was found to be a great deal larger than was anticipated. The lateral lobes were found along the posterolateral surfaces of the trachea. Following the operation he had a well marked diuresis, which indicated that previously he had retained fluid. During the first twenty-four hours he had a few minor syncopal attacks, but after this they never recurred. The metabolism on June 15, 1929 was minus 2. His clinical improvement was most striking. The heart remained slow and regular, he began to gain weight, and voluntarily remarked that he felt much better than he had for some months. He shortly returned to work and has been well in every way since.

Summary

This was a most unique experience, as I am unfamiliar with any instance in the medical literature in which Adams-Stokes attacks were associated with hyperthyroidism. The diagnosis was first suspected and later confirmed, at a time when the patient had a heart rate of 39, because of the features repeatedly emphasized in this paper, despite the absence of exophthalmos or any palpable thyroid whatever. The therapeutic result was most gratifying.

Summary and Conclusions

1. Attention is drawn to a group of patients usually treated for heart disease, in whom the underlying cause is a latent and unrecognized hyperthyroidism. These cases are generally overlooked, even by most competent internists, for the common signs and symptoms usually found in typical exopthalmic goiter and toxic adenoma are not evident in these patients.

2. The diagnosis is even more difficult in patients, who have co-existing organic heart disease, such as angina pectoris, hypertensive heart disease or mitral stenosis. Of special interest are those with typical anginal attacks, in whom proper treatment of the latent hyperthyroidism results in a great reduction in the number of attacks, if not complete relief from symptoms.

3. The diagnostic criteria are discussed and attention is especially directed to certain points in the general appearance of the patient and in the physical findings that lead one to suspect the presence of a latent hyperthyroidism.

4. Circulatory insufficiency is not a contraindication for surgery in the treatment of these patients, many of whom are relieved completely, and others much improved by subtotal thyroidectomy.

5. A series of cases is reported, all of which had been treated for a considerable period of time for heart disease, but in each of which there was an unrecognized hyperthyroidism either as the sole cause of the trouble, or as an additional burden on a heart already affected with some other organic lesion. In every case either complete cure or marked improvement was obtained, when treatment was directed at the previously unsuspected thyroid gland.

Lead Poisoning in the English Books of Trades*†

CARL VERNON WELLER, M.S., M.D., *Ann Arbor, Michigan*

THE Books of Trades attempt to give "Parents, Guardians and Trustees, as well as the Youths themselves, intended for Trades and Business, not only a general Description of almost all Handicrafts, Trades and Employs in Vogue, but also such Particulars of them, as will enable both the one and the other to form a tolerable Judgment which of them all may be most agreeable, and best answer their purpose." (Preface to 'A General Description of All Trades', 1747). If these prefatory promises were completely fulfilled the Books of Trades ought to reflect the state of knowledge of occupational disease at the times at which they were written, for one phase of the guidance promised the parents and trustees was to warn them of the hazards to be met in the various callings.

A group of these popular guides to the choice of a trade or business has been examined for evidences of knowledge that employment in those trades in which lead and lead compounds were used entailed a special possibility or probability of physical ills. Four Books of Trades ranging in date of printing from 1747 to 1837 have been used for this purpose. In order of publication these are:

1. A General Description of all Trades, Digested in Alphabetical Order, etc.; Printed for T. Waller, 1747.

2. The Book of English Trades and Library of the Useful Arts. Printed for G. and W. B. Whittaker, 1824.

3. The Book of English Trades and Library of the Useful Arts. Printed for J. G. and F. Rivington, 1835. (Much of the text of this book is identical with that of the preceding.)

4. The Complete Book of Trades, or the Parents' Guide and Youths' Instructor; Forming a Popular Encyclopaedia of Trades, Manufactures, and Commerce, as at Present Pursued in England, etc.; By Several hands, viz. Mr. N. Whittock, Mr. J. Bennett, Mr. J. Badcock, Mr. C. Newton, and others. 1837.

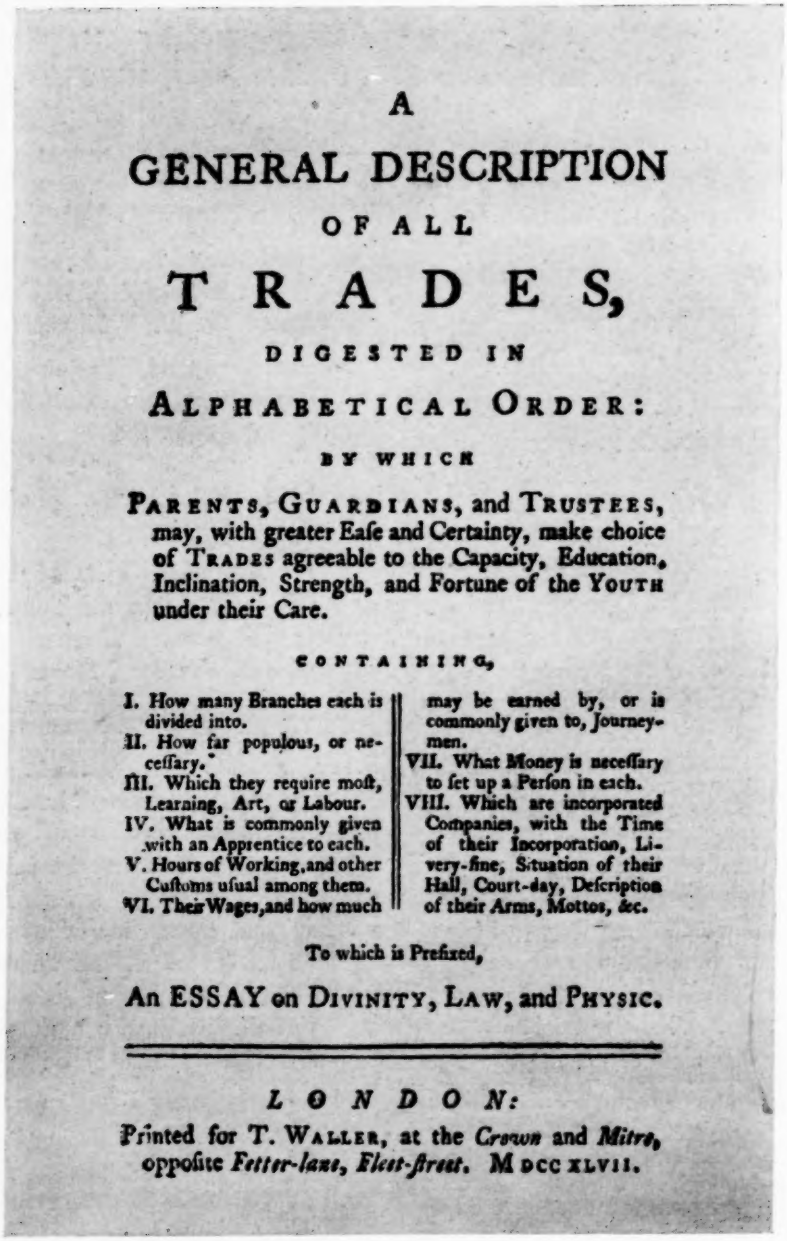
References which may be fairly interpreted as referring, perhaps unconsciously, to the hazards of lead poisoning will be quoted in full under each trade where such occur, except that verbatim duplications will not be repeated. The books will be referred to by using their respective dates of publication.

Color Men.

The business of the color men, the risk to health involved in this trade and the means to be made use of to avoid ill effects are all sufficiently set forth in the 1747 book, as follows:

*From the Department of Pathology, University of Michigan, Ann Arbor, Michigan.

†Read before the American Association of the History of Medicine, May 7, 1930.



A

GENERAL DESCRIPTION

OF ALL

TRADES,

DIGESTED IN

ALPHABETICAL ORDER:

BY WHICH

PARENTS, GUARDIANS, and TRUSTEES, may, with greater Eaſe and Certainty, make choice of TRADES agreeable to the Capacity, Education, Inclination, Strength, and Fortune of the YOUTH under their Care.

CONTAINING,

I. How many Branches each is divided into.
II. How far populous, or neceſſary.
III. Which they require moſt, Learning, Art, or Labour.
IV. What is commonly given with an Apprentice to each.
V. Hours of Working, and other Cuſtoms uſual among them.
VI. Their Wages, and how much may be earned by, or is commonly given to, Journeymen.
VII. What Money is neceſſary to ſet up a Perſon in each.
VIII. Which are incorporated Companies, with the Time of their Incorporation, Livery-fine, Situation of their Hall, Court-day, Deſcription of their Arms, Mottos, &c.

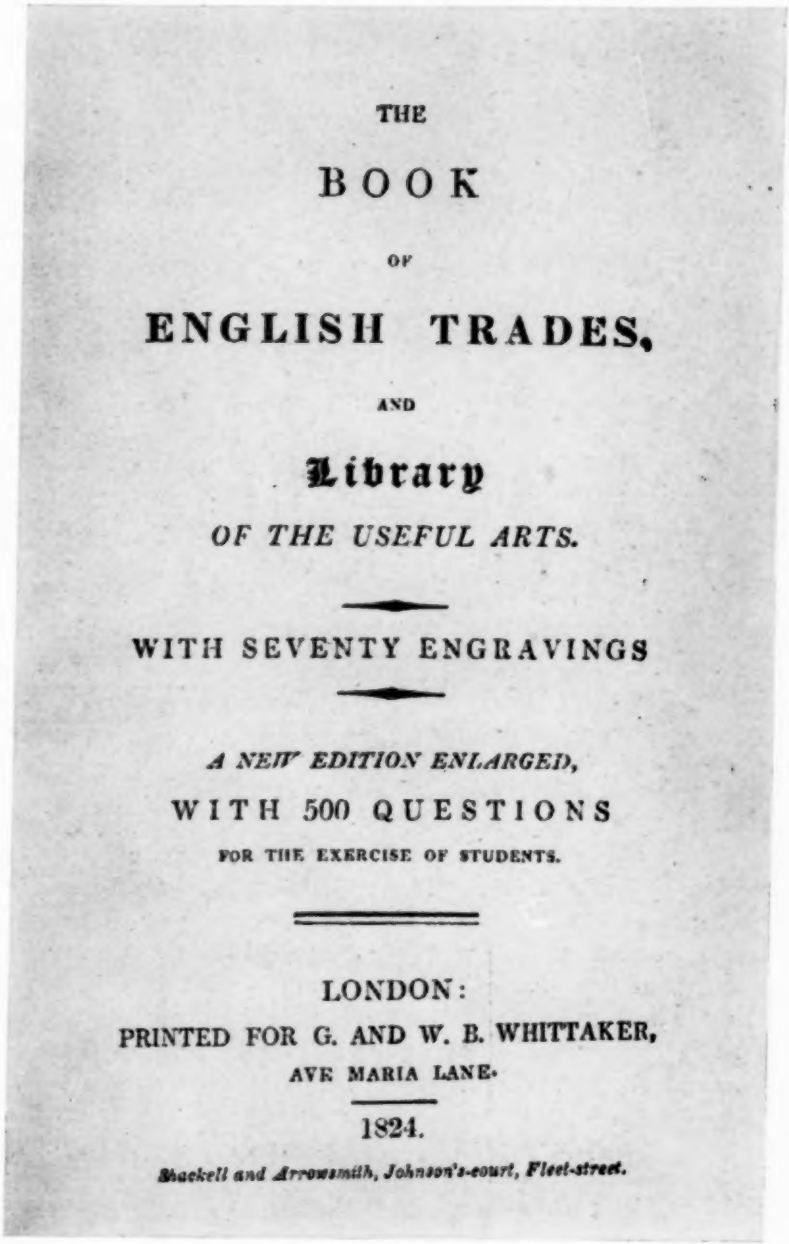
To which is Prefixed,

An ESSAY on DIVINITY, LAW, and PHYSIC.

LONDON:

Printed for T. WALLER, at the *Crown* and *Mitre*, oppoſite *Fetter-lane*, *Fleet-ſtreet*. MDCCXLVII.

FIG. 1. Title page of the Waller book of trades, 1747.



THE

BOOK

OF

ENGLISH TRADES,

AND

Library

OF THE USEFUL ARTS.

WITH SEVENTY ENGRAVINGS

A NEW EDITION ENLARGED,

WITH 500 QUESTIONS

FOR THE EXERCISE OF STUDENTS.

LONDON:

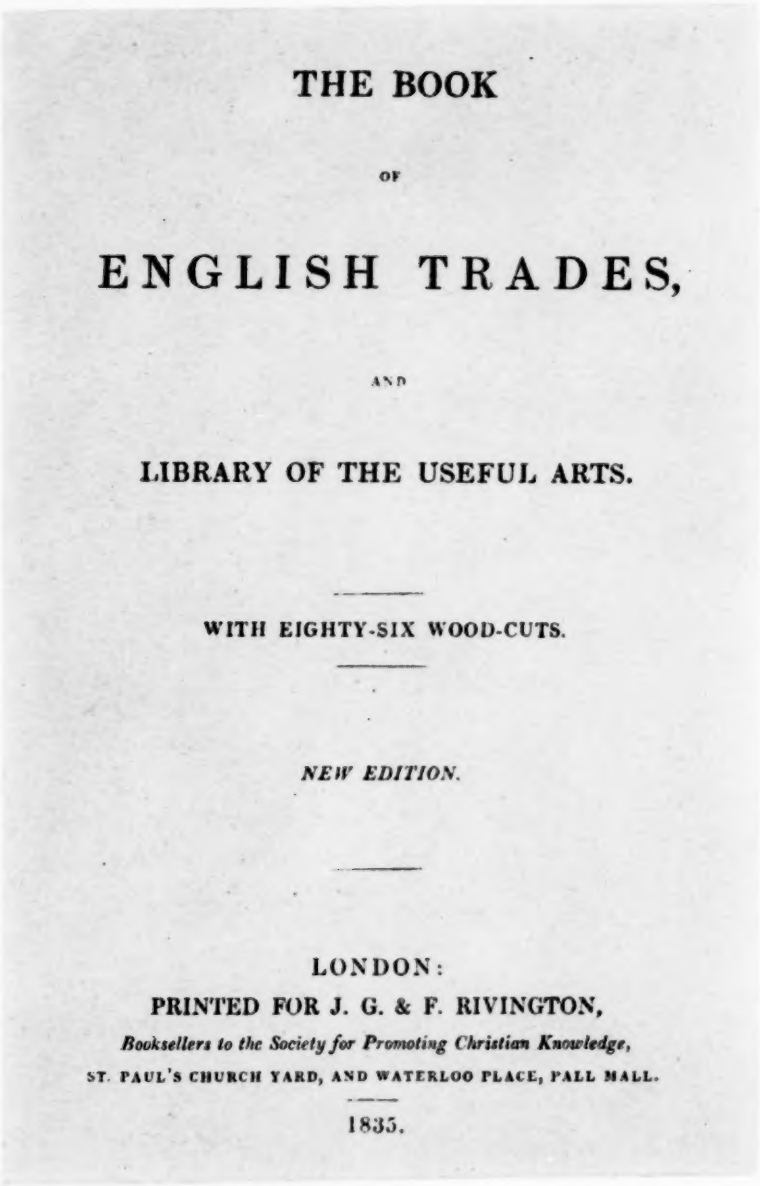
PRINTED FOR G. AND W. B. WHITTAKER,

AVE MARIA LANE.

1824.

Shackell and Arrowsmith, Johnson's-court, Fleet-street.

FIG. 2. Title page of the Whittaker book of trades, 1824.



THE BOOK

OF

ENGLISH TRADES,

AND

LIBRARY OF THE USEFUL ARTS.

WITH EIGHTY-SIX WOOD-CUTS.

NEW EDITION.

LONDON:

PRINTED FOR J. G. & F. RIVINGTON,

Booksellers to the Society for Promoting Christian Knowledge,

ST. PAUL'S CHURCH YARD, AND WATERLOO PLACE, PALL MALL.

1835.

FIG. 3. Title page of the Rivington book of trades, 1835.

THE COMPLETE

BOOK OF TRADES,

OR THE

PARENTS' GUIDE AND YOUTHS' INSTRUCTOR;

FORMING A POPULAR

ENCYCLOPÆDIA OF TRADES, MANUFACTURES, AND COMMERCE,

AS AT PRESENT PURSUED IN ENGLAND;

WITH A

MORE PARTICULAR REGARD TO ITS STATE IN AND NEAR THE METROPOLIS:

INCLUDING

A COPIOUS TABLE OF EVERY TRADE, PROFESSION, OCCUPATION, AND CALLING,

HOWEVER DIVIDED AND SUBDIVIDED:

TOGETHER WITH

THE APPRENTICE FEE USUALLY GIVEN WITH EACH,

AND

AN ESTIMATE OF THE SUMS REQUIRED FOR COMMENCING BUSINESS.

BY SEVERAL HANDS, viz.

MR. N. WHITTOCK, MR. J. BENNETT, MR. J. BADCOCK, MR. C. NEWTON, AND OTHERS,

AS MORE PARTICULARLY SET FORTH IN THE PREFACE

LONDON:

PUBLISHED FOR THE PROPRIETOR BY

JOHN BENNETT, 4, THREE TUN PASSAGE, IVY LANE, PATERNOSTER ROW,

AND SOLD BY

SIMPKIN, MARSHALL, & CO., STATIONERS' HALL COURT.

1837.

FIG. 4. Title page of the Whittock book of trades, 1837.

"The preparing and selling of all Sorts of Colours, Paints, Oils, and Varnishes, for the Use of Painters, Japanners, etc., is their Business, for which Purpose some keep large Shops and Warehouses, though they are not numerous; and it is a Branch of Trade in which there is much Profit, though somewhat hazardous to Health, especially if a Lad is not particularly careful to keep himself as clean as possible; nay, indeed, every one concerned in any Part of it ought to be so, which would prevent a great many Inconveniences: However, it is by no means fit for weakly Constitutions."

The nature of the affections common to this trade is not revealed. One might believe that the volatile solvents were concerned were it not for the fact that personal cleanliness is so strongly recommended as a preventive measure. This trade is not listed in the later books examined.

Painters.

The book of 1747 has but one short paragraph dealing with the diseases peculiar to painters. "House and Ship-painters' Work is by far the more populous, but the heaviest, and requires the most Care with respect to Cleanliness, they being often liable to nervous Disorders, occasioned by the Colours they use so much more of than the others." This is an undoubted reference to lead poisoning.

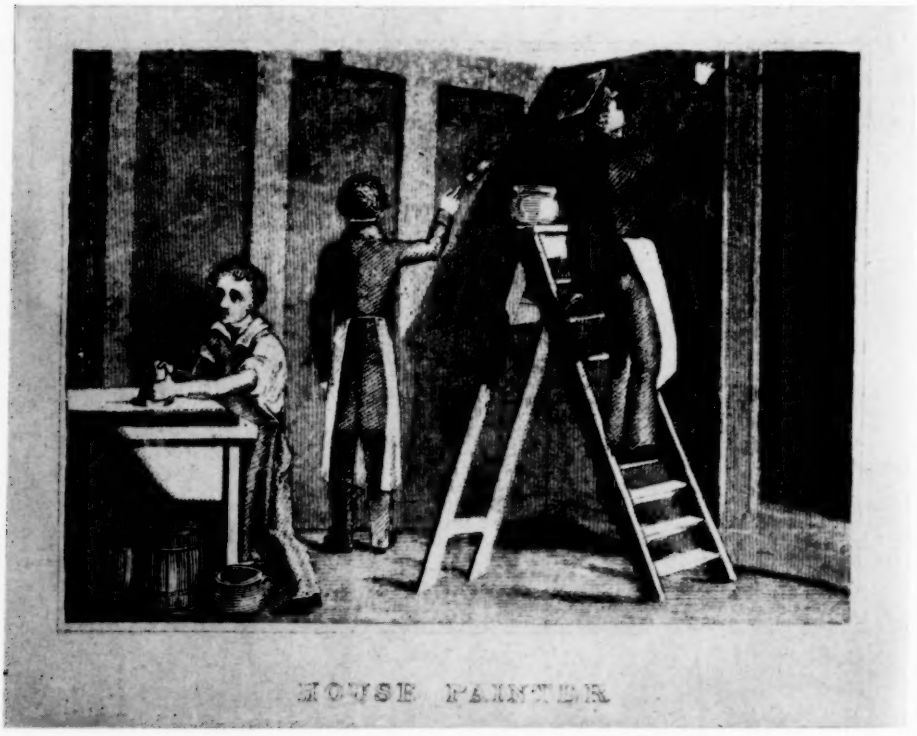


FIG. 5. The House Painter, from the Whittock, 1837, book of trades.

In 1837 the warning is much more forcibly given. After emphasizing the importance of a clear head while working at an elevation on scaffolding or ladders, and warning against the excessive use of the "oft replenished porter-pot" lest the painter fall to rise no more, the writer continues: "To this catastrophe he would the more assuredly tend, if, in the course of mixing and handling his colours, he do not carefully abstain from too close contact with the very deleterious compound of turps (turpentine) with the white lead, whence a noxious effluvium arises; but, whether by one means or the other, or with the addition of oil, or verdigris, he imbibes, takes up, or absorbs, into his bodily system, any of these, his limbs become paralyzed, he loses strength, and becomes a walking mummy; unless he previously loses firm hold on the frail supports of his person while at work, and he finish his career in the twinkle of an eye. Our duty towards the reader would have been performed imperfectly, but for this friendly premonition. The Painters of the present day, however, perform the principal part of the operation of grinding by means of mills, carried by *horse power*; which lessens the labour, truly, but still much remains of danger from the tippling carelessness of most of the men, though every one of them says he is perfectly aware of his danger, and well apprized of the means of prevention. These are, cleanliness of the person, particularly of the hands, and averting the head—the olfactory, upon pouring on the turps upon the white lead; changing clothes, linen and locality, after the work is over, etc., adds to the security from the paralytic attack; from which even a visit to the Bath waters cannot always relieve him, let Dr. Davis say what he may think proper on the occasion. We should hear with perfect indifference, the usual parting remark to one of those afflicted poor painters: 'You have had the benefit of the Bath waters, my man, and nothing more can be done for you;' for, we have inquired in vain for one successful case of such paralysis from the use of those celebrated waters. There, we have often seen long strings of such poor creatures, crawling to the bath, and have found numerous other painters in London who have tried them, without the desired effect." From all of this it will be seen that the writer had some notion of lead palsy and lead cachexia and no good opinion at all of the efforts of contemporary Medicine to cure or even relieve these afflictions. He was aware, also, of the great importance of personal cleanliness in preventing the development of lead poisoning.

Pewterers

The danger involved in the use of pewter containing too high a proportion of lead was early recognized. At Nuremberg in 1576 it was ordained that not more than one pound of lead should be mixed with every ten pounds of tin. In England regulatory provisions governing this matter were drawn up as early as 1348. At first as much as 26 pounds of lead could be used with each hundred weight of tin but the amount was soon greatly reduced. The 1747 Book of Trades is silent upon this question, calling at-

FIG. 6. The Pewterer, from the Rivington, 1835, book of trades.

tention only to the fact that the business of melting, casting and turning pewter is "not so healthy". But in 1824 it is more fully set forth. "Lead being the cheapest (sic!) of the two metals, the manufacturer finds it his interest to employ it in as large a proportion as possible. But as lead is well known to be a very noxious metal, experiments have been made to ascertain in what proportion it may be mixed with tin, without injury to the liquors for which pewter is commonly used. It has been found, when wine or vinegar was allowed to stand in vessels composed of an alloy of tin and lead, that the tin is first dissolved, whilst the lead is not acted upon by the liquors, except at the line of contact of the air and liquor; and that no sensible quantity of lead is dissolved, even by vinegar, after standing for some days in vessels that contained no more than eighteen pounds in the

hundred of lead. Hence it was concluded, that as no noxious effect is produced by the very minute quantity of tin which is dissolved, pewter may be considered as perfectly safe, which contains about 80 or 82 per cent of tin. And when vessels are employed for measures, a much less proportion of tin may be used. But it has been found that the common pewter at Paris, contains no more than about 25, or 30 per cent of tin, the remainder is lead; and there is great reason for believing that the pewter commonly used in England is of no better quality. It is evident, therefore, that the use of pewter vessels, unless the proportion of the alloy could be ascertained, is by no means desirable."

In the article dealing with the pewterer in the fourth book of the series under examination, that of 1837, even the comparative safety of those alloys containing a low percentage of lead is questioned, and the danger to both the artificer and to the user is set forth.

"Pewter is composed of tin and lead, or lead and the regulus of antimony, in proportions of ten, twelve, or fourteen of the softer to one of the harder metals . . . We also hear of pewter being compounded of all three of these simple metals; but mix them how you may, and though zinc be added, the poisonous nature of all, whether separate or combined, cannot be denied." After commenting on the constant occurrence of arsenic in the tin, "the least objectionable of all", the writer continues:- "Let these poisons repose how they may in your utensils, when the contained liquids are employed *cold*, the proportion of 20 or 25 per cent of tin (if the proportions ever reach so high), cannot divest the lead of its deleterious nature, especially when used with acetous acid. Spoons, plates, etc., give out the sugar of lead (*sacch. plumbi*) whenever vinegar is applied to the salad, to cucumber, to oyster, or to meats, —with fatal consequences. . . . . In whatever manner the workmen are engaged in melting, forming, or handling any of these metals, together or separately, they lose health, become pale, experience visceral derangement and intumescence, or fall into paralysis—in the degree that their contact, or exposure to the melting fumes, may be more or less."

Plumbers

In 1747 the work of plumbers is described as having to do with keeping out the rain and with conveying and storing liquids. "It cannot be called very hard Work, the casting Part whereof is the heavier, apt to render the Labourers in it unhealthy (without Care is taken to be cleanly) and sometimes hazardous." In 1824 the warning is more strongly put:- "The health of the men is often injured by the fumes of the lead. Journeymen earn about thirty shillings a week; and we recommend earnestly to lads brought up to either of the before-mentioned trades [painter, plumber], that they cultivate cleanliness and strict sobriety, and that they never, on any account, eat their meals, or retire to rest at night, before they have well washed their hands and face." Under this heading the Whittock Book of Trades of 1837 has but one sentence dealing with this disease

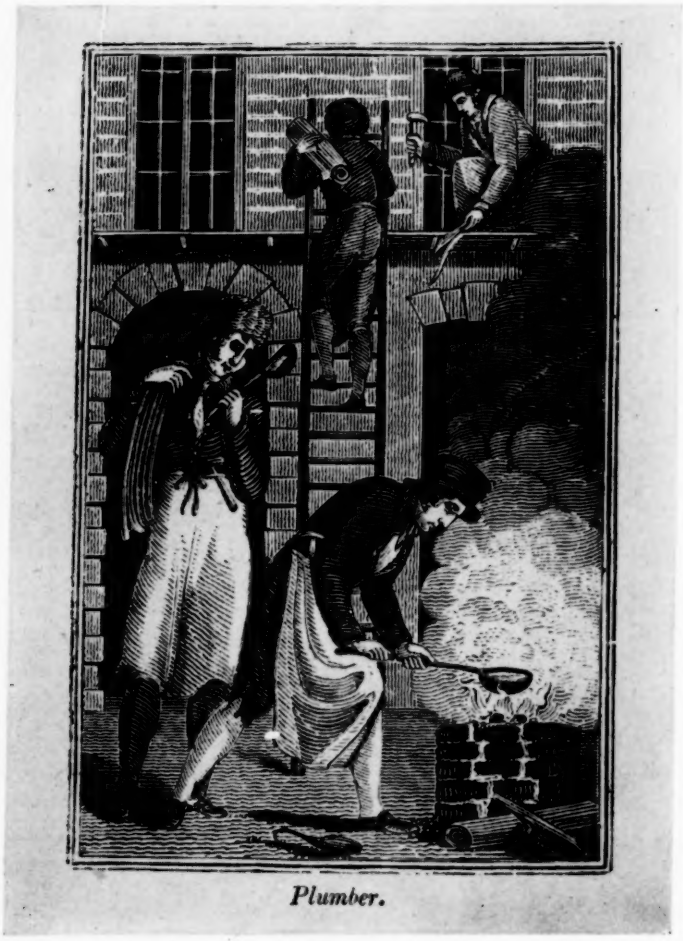
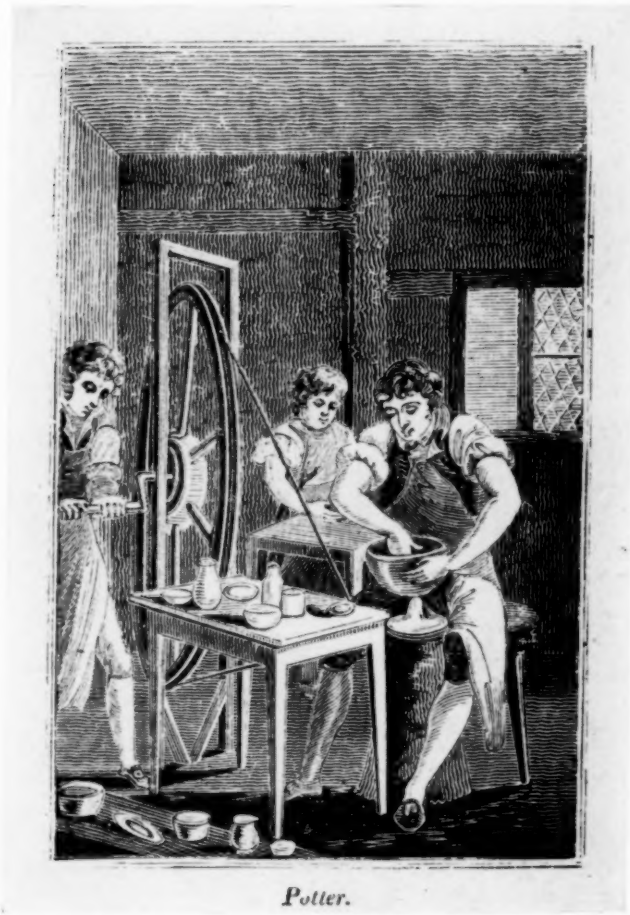


FIG. 7. The Plumber, from the Rivington, 1835, book of trades.

hazard: "Under the article Painter, we have noticed the danger to health which is to be apprehended from the volatilized fumes from lead; and the same remarks apply to the casting of sheet-lead, pipes and *melting of solder*, which constitute the trade of a Plumber."

Potters

It is remarkable that the only reference to the health hazard for pottery workers in these four Books of Trades is to be found in the earliest, that of 1747, and this is but a feeble warning in one parenthetical explanation:- "The Masters in all the Branches (none of which can be called very hard Work, though not the most cleanly Employ, and apt to render the Workmen unhealthy, if not careful) take apprentices." Can it be that the complete lack of discussion of this question in the later books of much larger size means that the physical ills



Potter.

FIG. 8. The Potter, from the Rivington, 1835, book of trades.

common to potters were so well known that they were taken quite for granted?

Printers and Typefounders

In the discussion of the Printer's activities there are no references which can be interpreted as having to do with lead poisoning. In the book of 1824, however, there is a brief reference to the hazard of fumes from the molten type metal. "In large foundries this metal is cast into bars of about twenty pounds each, which are delivered to the workmen as conditions may require; this is a laborious and unwholesome part of the business owing to the fumes which are thrown off."

When contemporary knowledge of occupational diseases and of lead poisoning especially is considered, it is surprising that these Books of Trades have such a relatively small

FIG. 9. The Type Founder, from the Rivington, 1835, book of trades.

amount of material upon the subject. In 1700, forty-seven years before the first of these books, Ramazzini's *De Morbis Artificum Diatriba* had appeared. This had been put into English by 1705 and had passed through various editions in that language, as well as sundry Latin editions printed in England. In this work the diseases of Potters and of Painters are described in great detail and certain signs and symptoms correctly ascribed to lead poisoning. Ramazzini's book was the standard text upon occupational diseases during the period covered by these Books of Trades. Long before this time Citois had described Poitou colic and Stockhausen had shown that this condition was produced by lead in various forms.

Why did not the writers of the English Books of Trades take advantage of this knowledge of trade diseases? Several answers to this ques-

tion present themselves. In the first place these books are the most obvious hack writing, copied to a greater or less extent one from another and running through many editions with but slight addition of new material. They were intended for popular sale and so were kept small and inexpensive. In the second place there is no evidence that any of the various authors had had medical training or had sought medical collaboration. On the contrary, it is made clear in the extensive quotation from the article on Painters in the book of 1837 that the particular author responsible for that section was far from being sympathetically inclined toward the medical activities of his own period. Then, too, there is an evident desire not to describe any one trade in such a condemnatory manner as to discourage entirely the young man from entering upon it. If unfavorable conditions are referred to, something on the opposite side is introduced to balance the scale. The authors had no desire to arouse the antagonism of any group of tradesmen. Finally, we must believe that certain hazards were so obvious, so much a matter of daily experience, that they were taken for granted then as others are now and were therefore not described. Such must have been the reason why the English Books of Trades failed in such a large measure to equal the medical works of their period in regard to descriptions of industrial lead poisoning.

Editorials

THE TREATMENT OF PERNICIOUS ANEMIA WITH STOMACH AND STOMACH EXTRACT

Some time ago in these columns we referred to a preliminary report of Sturgis and Isaacs on the treatment of pernicious anemia with dessicated hog's stomach. Although in the three patients to whom this treatment had been given there was observed a typical marked reticulocyte reaction, with a typical increase of the hemoglobin and red blood cells, it was felt that the number of cases reported did not form a sufficient foundation on which to base definite judgment as to the value of the new treatment, especially since on the basis of their meagre observations Sturgis and Isaacs were inclined to the opinion that the stomach treatment was more active than that of the liver. Confirmation of their results appeared in a communication by Conner, who treated six cases of pernicious anemia with swine stomach; and also by Wilkinson, who found both the mucosa and muscularis to be potent. Further confirmation of the results obtained by Sturgis and Isaacs has been recorded in short reports by Hitzenberger, Snapper and Dupreez, and Rosenow. Recently E. Meulengracht and A. Hecht-Johansen, of Copenhagen,* have reported four cases of pernicious anemia treated with dried, pulverized swine stomach. Their preparation was made according to the method of Sturgis and Isaacs: whole, fresh swine stomachs, both mucosa and muscle coats, were quickly dried at low temperature, the fats removed by benzine, and the residue pulverized and passed through a sieve. There remains a whitish-gray powder, 30 gm. of which corresponds roughly to about 200 gm. of the fresh tissue. The powder has a slight odor, but is practically tasteless. The powder was administered by mixing 10 gm. with raspberry juice to a thin mixture in the bottom of an ordinary water glass, which was then filled up to one-third of its content with cold water. In this form it was taken with relish by the patients. In daily doses of 20-30 gm., corresponding to 130-200 gm. of whole swine stomach, this dried stomach substance has a powerful therapeutic action on pernicious anemia. Whether more potent than liver could not be determined at this time, but these workers regard this as not improbable. On the other hand, an extract of swine stomach, even in doses corresponding to 400 gm. of whole swine liver, given daily was found to be negative. This observation has great theoretic interest, in that it would appear that the active principle is not preformed ("aufmaga-ziniert") in the stomach, but is found, or set free, only after the powdered

*Klin. Wochenschr., June 21, 1930.

stomach, which contains both the mucosa elements and the muscle-protein from the muscularis, is introduced into the intestinal canal. This confirms Castle's original experiments, upon which all the stomach work has been based, that the natural stomach-juice does not contain the active principle, but that this is first produced, only when the gastric juice acts upon muscle. To go back to Castle's experiments, he found that muscle (meat) digested in the human stomach, or in vitro with normal gastric juice obtained from the normal stomach after injection of histamin, contained the same active therapeutic principle for pernicious anemia as that found in liver, as shown by its administration to pernicious anemia patients. The active principle, however, could not be produced in vitro with pepsin + hydrochloric acid + meat, which led to the conclusion that the natural gastric juice contained something more than the pepsin, which is necessary for the formation of the active therapeutic substance during the digestion-process of the meat. From this, it was but logical to conclude that this necessary substance is lacking in the stomachs of patients with pernicious anemia. The lowered gastric function has long been recognized as one of the most fundamental phenomena of pernicious anemia; and the observations of Castle are to be counted as representing the most striking advance in our knowledge of the stomach condition in this disease. In spite of its brilliant results the liver treatment of pernicious anemia cannot be regarded as the final treatment of this disease. That this is generally recognized is shown by the excessive zeal shown in the search for new methods of treatment. These attempts are motivated through the uncertainty as to the theoretic foundation of the liver cure, and its relation to the cord changes and other phenomena more or less constantly associated with pernicious anemia. For the present moment, it is, however, of great practical significance that dried, fat-free, pulverized swine stomach undoubtedly contains as active, or even a more active, therapeutic principle for pernicious anemia than does liver, since the cost of the stomach powder is far less than that of the liver extract. Castle's experimental work, and the clinical application by Sturgis and Isaacs, are of first importance in advancing our knowledge of the treatment of pernicious anemia beyond the stage of the Minot liver cure.

THE SCOPE AND AIM OF THE COMMITTEE ON THE COST OF MEDICAL CARE

At the spring meeting of the Committee on the Cost of Medical Care in Washington, May second and third, 1930, a special committee of private practitioners was appointed to consider the relation of the committee to the private practitioners of the country. This committee, composed of the undersigned members, now submits the following statement for the information of these practitioners on the scope and aim of the committee's work.

It was clearly recognized by all present at the spring meeting that the committee has undertaken a program of studies which in its scope goes far

beyond that part of the cost of medical care which physicians provide. The expense of several other kinds of service now looms large in the total cost of many illnesses. In addition, special emphasis was given at the meeting to the question of the adequacy of the various services available in a community. Finally, the committee adopted a statement of three fundamental principles proposed by the Chairman, which should go a long way toward reassuring those who have been apprehensive regarding the nature of the committee's ultimate recommendations.

I.

The committee is interested in far more than the physician's bill, which, in many instances, is considerably less than half the total cost of illness. Hospital care, nursing, dentistry, laboratory examinations, and medicines often involve considerable expense, as is clearly shown by several of the committee's studies which are now being completed or have already been reported upon. In one middlewestern county recently surveyed, the expenditures for various kinds of medicines constituted over one-third of the total expense for medical care, and were 20 per cent greater than the costs of physicians' services. It is also becoming apparent that a great deal of money is being spent for useless medicines and for various irregular forms of treatment which do the patient no good or which may result in positive harm.

In order to indicate clearly the broad scope of the committee's work, it was decided at the spring meeting to make a slight change in its name. The word "cost" is to be changed to "costs." The complete name of the committee, with subtitle, will henceforth be "The Committee on the Costs of Medical Care—Organized to Study the Economic Aspects of the Prevention and the Care of Sickness, including the Adequacy, Availability and Compensation of the Persons and Agencies Concerned."

One vital problem before this committee, declared a prominent physician member, at the recent meeting, is the determination of yhat is reasonably adequate care. In many cases of obscure disorders and serious illness, expensive facilities are essential. Presumably, there must be available in the community well trained general practitioners, certain specialists, dentists, nurses, hospitals and health agencies,—trained and well equipped to do their part in providing all the care that the individual may need. A plan of the executive committee, to conduct a study to determine standards of adequate medical care, under the general direction of some well known competent physician and with the assistance of a committee of fifteen or twenty other physicians, was heartily endorsed at the meeting of the general committee.

The aim of the committee is to study the problem described by Dr. Olin West, the Secretary of the American Medical Association, as the one great outstanding problem before the medical profession today. This he says is that involved in "the delivery of adequate, scientific medical care to all the people, rich and poor, at a cost

which can be reasonably met by them in their respective stations in life." The committee is endeavoring to establish a foundation of facts which have an important bearing upon this problem. On the basis of these facts, it will propose recommendations for the provision of adequate and efficient therapeutic and preventive service for all the people at a reasonable cost to the individual, which, at the same time, will provide physicians, dentists, nurses, hospitals and other agents assurance of adequate return. This is not a new statement of aims. Recent discussion, however, has given new emphasis to certain aspects of it. There are important items in the cost of sickness other than the physician's bill; and the adequacy of the service provided must be considered. The program of studies is a comprehensive one. It deals with questions of supply, demand, distribution and costs of all kinds of services, both preventive and curative; the relation of these costs to other expenses; the return accruing to the practitioners and various agents furnishing medical services; and especially will it seek to determine what standards of adequacy may reasonably be expected.

II.

Dr. Ray Lyman Wilbur, Chairman of the committee, proposed at the meeting May 2nd a statement of three fundamental principles for the consideration of the committee. This statement was referred to each of four subcommittees which held sessions during the two day meeting. The entire committee, at its last session, May 3rd, adopted with a few verbal changes the three principles. These will be of special interest to the physicians and dentists. They follow:

1. *The personal relation between physician and patient must be preserved in any effective system of medical service.*

Medical service is and doubtless, by its very nature, must remain a distinctly personal service. Even in this age of standardized commodities for the table, ready-to-wear clothing, and interchangeable spare parts for all types of machines, there has been no plan suggested for the reduction of medical diagnosis and treatment to basic units which can be ordered from travelling salesmen or acquired through correspondence courses. The physician must see his patient and see him, in many cases, over an extended period of time if the diagnosis and treatment are to achieve the greatest possible accuracy and efficiency. There is no substitute for personal observation.

Man is not a standardized machine and each individual reacts to the conditions of life in a manner in some respects unique. In the treatment of disease, this individual variation is a factor of great significance and can receive due consideration only when the practitioner has known the patient for a considerable time and maintains a personal relation with the patient.

2. *The concept of medical service of the community should include a systematic and intensive use of preventive measures in private practice and effective support of preventive measures in public health work.*

The cost of adequate curative treatment is now high and may continue to increase as expensive procedures resulting from scientific progress become more widely used. Sickness, in addition, involves other personal and social costs, some of which cannot be measured in monetary terms.

The outstanding achievements in scientific medicine have been made in the preventive rather than the curative field. Knowledge now available for the control of malaria, tuberculosis, smallpox, diphtheria, pellagra, typhoid fever, hookworm disease, and goiter, if effectively applied, would make unnecessary a considerable proportion of the present expense for the cure of sickness.

3. *The medical service of a community should include the necessary facilities for adequate diagnosis and treatment.*

From the standpoint of effective diagnosis, many diseases, such as tuberculosis, cannot be recognized promptly in their early stages without the aid of elaborate technical equipment. From the standpoint of adequate therapy, if the best of modern technique is not immediately available, complete cures are either delayed or rendered impossible of attainment. To cite a specific illustration of the improvement of modern therapeutic procedures over those of ten years ago, the time required for treatment of fractures of the hip, and the percentage of permanent invalidity resulting from that injury have each been reduced by more than half.

We cannot be content with anything except the best possible service that modern science can provide and it is therefore imperative that modern scientific equipment for the diagnosis and treatment of disease be available to the practitioners of medicine in every community.

Special Committee of Private Practitioners
Stewart R. Roberts, M.D., Chairman
Walter P. Bowers, M.D.
A. C. Christie, M.D.
Haven Emerson, M.D.
George E. Follansbee, M.D.
M. L. Harris, M.D.
J. Shelton Horsley, M.D.
Kirby S. Howlett, M.D.
Arthur C. Morgan, M.D.
Herbert E. Phillips, D.D.S.
C. E. Rudolph, D.D.S.
Richard M. Smith, M.D.
N. B. Van Etten, M.D.

Abstracts

Outbreak of Psittacosis in a Department Store. By L. F. BADGER (Public Health Reports, June 20, 1930).

Four cases of psittacosis, all employees of a department store employing 500-600 persons, were reported by 3 physicians, 1 physician reporting 2 cases. It was learned on visiting these cases, that a number of other employees were ill at the time with apparently similar symptoms. Most of these were employed on the floor on which parrots were kept. Twenty-five employees were absent from work for periods of four weeks or longer. The onset of their illness occurred between December 14 and January 13. Histories typical of psittacosis were obtained on 17 of the 25. The following are the symptoms of the cases summarized: Rather sudden onset; chills; fever; malaise; severe headache most frequently occipital; loss of appetite; coated tongue; constipation (occasionally diarrhea); unproductive cough; marked bronchitis with indefinite areas suggesting pneumonia; fever reaching 103° or 104° F.; lack of definite gastro-intestinal symptoms; lung pathology out of proportion to other findings; delirium varying in degree; leucocyte count normal or below. From the manner in which the parrots were handled in the department store there existed abundant opportunity for both direct and indirect infection. The birds were cared for by four of the employees, three of whom became ill. Other employees would frequently visit and handle the birds; particularly was this common during the noon hour. It was probably not rare for customers to come into direct contact with the birds. The opportunity for infection through indirect contact was also great, especially since the parrots were kept on perches outside the cages during the day, and on one occasion had escaped and were free about the floor. Four of the cases, on whom complete histories were obtained from their physicians, denied any direct contact, 12 admitted direct contact, and in 1, due to death, the mode of contact was undetermined. There were probably many unknown cases occurring among the employees. It was not uncommon for employees from floors other than the one on which the birds were kept to visit and handle the parrots, yet but three cases in such employees are known. One case, terminating fatally, occurred in a non-employee who had visited and fondled the parrots. There existed a possibility that other similar cases occurred. A remarkably high morbidity rate occurred in the employees on the floor on which the birds were kept. The floor is L-shaped, and a section at the end of one wing was reserved for birds. In this wing from 20 to 30 persons were employed, among which 18 of the known 25 cases occurred. Parrots obtained from the same importer as were these implicated in this epidemic have caused cases of psittacosis in other sections of the country. In addition to the parrots, some of the parrokeets might have been a factor in the spread of the disease. Approximately 24 parrakeets died, and numerous reported cases of psittacosis have been contracted from this bird.

The Circulatory Failure of Diphtheria. By FRANCIS F. SCHWENTKER and WILLIAM W. NOEL (Bull. of the Johns Hopkins Hospital, November, 1929, April and June, 1930).

This work is reported under the heads of: I, The Clinical Manifestations of Early and Late Failure; II, The Carbohydrate Metabolism in Diphtheria Intoxication; III, The Treatment of the Circulatory Failure of Diphtheria. The first division confirms the studies of Warthin and Marvin in regard to the classification of the circulatory failure of diphtheria into two groups, early and late on the basis of the clinical symp-

toms and the pathological picture presented. Early circulatory failure is an essential part of the diphtheria intoxication and should be treated accordingly. The late circulatory failure, however, is a complication of the disease, caused probably by local inflammatory reactions incident to regeneration and repair. In the second division of the investigation the authors present evidence which points to a marked abnormality in the carbohydrate metabolism in cases of diphtheria intoxication. This is manifested by a primary increase in glycogenolysis in the first stage of the toxemia and a resultant rise in blood sugar. Following this there appears a marked hypoglycemia in very severe cases. In the more protracted cases, however, there seems to follow a decrease in glycogenesis, due probably to a suppression of the production of insulin, with a resultant hyperglycemia. The liver and muscles show a marked diminution in glycogen content in all cases. They feel, therefore, that the symptoms of diphtheria intoxication are in a large part due to secondary nutritional disturbances in all of the essential body tissues. The administration of insulin in these cases causes the assimilation of the dextrose, most probably through the usual glycogenic channels. A consideration of these facts suggests a mode of treatment. If carbohydrates were supplied to the body through intravenous injections of dextrose, and then made available by the administration of insulin, these nutritional disturbances might be balanced. In this way, the toxic patient showing signs of circulatory collapse might receive sufficient support to allow the antitoxin to counteract the toxemia and ward off impending death. They treated 14 cases suffering from diphtheria with intravenous injections of dextrose. All of them were so toxic that death was imminent; several were unconscious. Three of the patients showed no symptoms referable to circulatory embarrassment; four showed a loud systolic murmur. In one case there was an enlarged painful liver but no other signs of a failing circulation. Three patients presented a systolic murmur and an engorged liver only; in two cases there was an evident cardiac arrhythmia in addition to the murmur and enlarged liver, while in one patient a systolic murmur, an enlarged liver, an arrhythmic pulse and a protodiastolic gallop rhythm gave evidence of a severely damaged circulatory system. Thirteen of these cases recovered. In most instances the symptoms were rapidly alleviated; the temperature and the pulse rate returned to normal within 24 hours after the injection, the toxic condition disappeared, and convalescence was uneventful. Two of the patients, however, remained toxic for two days despite large doses of antitoxin and frequent intravenous injections of dextrose. From the throat of these patients hemolytic streptococci were cultured in addition to the Klebs-Loeffler bacillus. In one case death occurred four hours after admission. The patient, however, had been ill for days and was moribund when first seen. The authors believe, that, in most of these cases, death would have supervened had the patients not received sufficient dextrose to supply nutrient material to a rapidly failing circulatory system. For this reason, they have adopted in cases of severe toxemia and early circulatory failure in diphtheria, the following general management. The patient receives immediately on admission a large dose of antitoxin intromuscularly. One-half hour later, if no reaction has occurred, 10,000-20,000 units of additional antitoxin and 20 grams of a 50 per cent solution of dextrose are injected intravenously. Ten to twenty units of insulin are supplied intramuscularly. They prefer, in this stage, to supply the fluid by the subcutaneous or intraperitoneal route rather than risk an added load on a failing circulation. Should the patient be restless, which is rarely the case, sedatives are given to obtain complete rest. At intervals varying from 12 to 24 hours, according to the degree of toxemia, the intravenous injection of dextrose is repeated, each time supplemented by insulin. The quantity is so chosen that 1 unit of insulin is given for each 1-2 grams of dextrose. The more toxic the case, the greater the amount of insulin necessary to cause complete utilization of the carbohydrate. After the first or second injection, the dextrose may be given as a 10 per cent solution in order to supply the needed fluid. The administration of dextrose and insulin in

this manner is repeated until the patient's condition is satisfactory and recovery seems certain. There is no rationale in treating cases of late circulatory failure in this manner, since the patient is already in convalescence and the carbohydrate metabolism has returned to normal. It seems, to the writers, however, that the administration of dextrose in the early stages would lessen the degenerative changes in the myocardium, and thus decrease the late inflammatory reaction which is so apt to cause delayed circulatory failure. It may be significant that despite the toxic condition of all the cases treated with dextrose, only two developed any sort of late circulatory abnormality, and these were only transient extrasystoles. [This is an important contribution to the therapy of diphtheria, and if these extraordinary results can be confirmed by others, this method of treatment must tend to lessen greatly the mortality in this disease, inasmuch as diphtheria deaths are today chiefly the result of the toxic action upon the myocardium. *Note by editor.*]

A New Meningococcus-like Organism (Neisseria flavescens n. sp.) from Epidemic Meningitis. By SARA BRANHAM (Public Health Reports, April 18, 1930).

During an epidemic of cerebrospinal meningitis in which all four of the usual types of meningococci were involved, an apparently new form was isolated from the spinal fluid of 14 cases. In morphology this microorganism is indistinguishable from the other members of the genus Neisseria. It differs from the meningococcus in pigment production, lack of fermentative action, and in antigenic relationship. These 14 strains form a homogenous group culturally, biochemically and serologically. The name, *Neisseria flavescens*, n. sp., is proposed for this new form. Since 30 per cent of the spinal fluid strains received from this locality belong to this group comprising 9 per cent of the total number of strains received at the Hygienic Laboratory during 1928-29, since it is not represented in any of the therapeutic polyvalent serums now manufactured, and since the mortality in these cases was at least 30 per cent, the occurrence of *N. flavescens* in epidemic meningitis warrants especial attention.

The Incidence of Bovine Tuberculosis in Children. By R. M. PRICE (Canad. Public Health Jour., 1929).

In a study of tubercle bacilli isolated from children, 190 strains recovered from both medical and surgical cases were dentified. Of these, 160 strains proved to be of human variety, and 30 strains, recovered from 20 different patients, proved to be of bovine origin. In the majority of cases from which the human type was recovered, a history of contact to open pulmonary tuberculosis was obtained, and in a certain proportion of the surgical cases there was evidence of tracheobronchial or pulmonary tuberculosis, demonstrable on physical examination or X-ray. All these children reacted to tuberculin. Thirty strains of bovine tubercle bacillus were recovered from twenty patients in our series, the oldest being a patient twelve years of age, and the youngest an infant of five months. In most of the cases investigated, a direct relationship with infected milk was demonstrated. In one of the cases studied, it was possible to demonstrate tubercle bacilli in the milk used. It is of interest to note that the bovine strains isolated were recovered from different sources, namely, cerebro-spinal fluid, meninges, lymph glands, mastoid process, tonsils, adenoid tissue, kidneys, and in one instance from the sputum. Of these regions, the lymph glands, particularly those of the neck, were the most common sites of infection. All these children came from districts in regions where pasteurization of mlk was not carried out. In all cases the evidence pointed to an alimentary route of infection. From this limited study it would appear that bovine tuberculosis is a factor in childhood infection in rural Canada, and in unpasteurized areas. The incidence of such infection is probably far greater than we are aware of. Milk is the vehicle for the transmission of the bovine tubercle bacillus. Tissue localization of the bovine tubercle bacillus is peculiar to certain regions, the lungs being practically immune. In the Toronto district, which is a pasteurized district, not a single case of bovine infection has been recovered

up to the present time. If it is permissible to draw conclusions in terms of percentage incidence from this small group of cases studied, about 12 per cent of surgical tuberculosis in children, leading to operation, disablement and disfigurement, and occasionally leading even to the death of the child, is preventable, and can be easily controlled by the simple means of pasteurization, or boiling of milk.

Reviews

Tuberculosis Among Children. By J. Arthur Myers, Ph.D., M.D., F.A.C.P., Chief of Medical Staff, Lymanhurst School for Tuberculous Children, Associate Professor of Preventive Medicine, University of Minnesota. With Chapters by C. W. Stewart, M.D., Ph.D., Assistant Professor of Pediatrics, University of Minnesota; Paul W. Greisler, M.D., Assistant Professor of Orthopedic Surgery, University of Minnesota. An Introduction by Allen K. Krause, M.D., Director, The Desert Sanatorium and Innstitute of Research; Editor, American Review of Tuberculosis. 208 pages, 43 illustrations, 1 color plate of the Mantoux reaction. Charles C. Thomas, Springfield, Illinois, 1930. Price in cloth, $3.50.

This work is divided into two parts; the first of which, Tuberculosis in Infancy, consists of eight chapters: Congenital Tuberculosis, Exposure to Tuberculosis and Tuberculous Infection, Diagnosis of Tuberculous Infection, Allergy and Immunity, Childhood Type of Tuberculosis in Infancy, Other Forms of Tuberculosis in Infancy, Tuberculous Meningitis, and Prevention of Tuberculosis in Infancy. Part II, Tuberculosis in Childhood, has the following chapters: Incidence of Tuberculous Infection in Childhood; Tuberculous Lesions in the Chest in Childhood; Tuberculosis of the Bones and Joints; Other Tuberculous Lesions in Childhood; Chronic Non-tuberculous Basal Pulmonary Diseases in Childhood. There is much good material in this book, but the reviewer on examining it obtained an impression that it is too condensed. Some subjects are too briefly considered. In a book on tuberculosis in infancy and in childhood surely more attention should have been accorded the bovine tubercle bacillus than the brief mention given it on pages 61, 63 and 83. Further the discussion on placental tuberculosis and placental transmission is very superficial, and the conclusion that congenital tuberculosis rarely occurs in the human family is not supported by the actual evidence in the literature. Schmorl's work is not mentioned, nor is the evidence from the Pathological Laboratory of the University of Michigan, from which eight cases of placental tuberculosis have been reported in a series of routine examinations of placentas. Only the literature on the subject since 1922 has apparently been examined, and not all of that appears to have been known to the writer. From the reviewer's standpoint Chapter I is superficial and mis--leading in its conclusions. The author, however, but reiterates the commonly accepted textbook statements as to the frequency and importance of congenital tuberculosis. To be commended, however, are his conservative statements regarding the Calmette vaccine, and its possible dangers. These have only recently been confirmed in the unfortunate experience in Germany. The book is a very good, but very concise, clinical manual of tuberculosis in the early years of life, and for this reason will be worth its purchase and perusal by any one who is engaged in, or interested in, the practice of pediatrics, or of tuberculosis.

Diabetes. Directions for Treatment by Insulin and Diet. By Benjamin F. Smith, M.D., Physician and Lecturer to St. Joseph's Infirmary, Hermann Hospital, and Jefferson Davis Hospital, Houston, Texas. 222 pages. D. Appleton and Company, New York, 1930. Price in cloth, $2.00.

According to the author's preface this little manual has been gradually evolved to meet the needs encountered in the author's practice while caring for diabetes. For a time, the diets, etc., were written out for the patients, then mimeographed sheets were used, and finally the demand upon his time

and the number of sheets required for each patient made it necessary to assemble the information in the form of a small book. The feature of the manual is the table of diets so arranged that the carbohydrate content may be changed without changing the protein or caloric value. Such an arrangement greatly facilitates the determination of the patient's tolerance for carbohydrate, a very great help when the patient is treated at home. The diets are composed of simple foods, viz:—oatmeal, grapefruit, 5 per cent vegetables, cream, egg, beef, bacon, butter, and, in diets containing larger amounts of carbohydrate, potato and bread. Numerous substitutes for these foods are given and in definite amounts, so that they may readily be included in any meal. Information and instructions are given which enable the patient to cooperate with his physician. The book is divided into seven chapters: General Considerations; Insulin; Instruction to Patients; Classification of Vegetables, Fruits and Fish; Diets; Substitute Foods; and Recipes. Of the making of books of this type, there seems to be no end, as in the last several years we have reviewed at least a dozen of its kind in these columns. The excuse for the appearance of so many manuals for the diabetic would appear to lie in the fact that each successful specialist in the treatment of diabetes, or who has many cases of this disease to treat, comes, sooner or later, to work out a method all his own, differing in various aspects from those followed by other specialists in the same field. Naturally he desires a manual for his own convenience, which will adequately present his own peculiar slant, and which can be used for distribution among his own patients. One would think that there would be an identical sameness in the various manuals that have been published, but this is not the case, as each reflects the individual experience of the author. Perhaps the only way out of it for the general practitioner is to examine them all, and then to choose the one he likes best, or finds best adapted to his own views and practices. The general information concerning diabetes given in these manuals is about the same, and is usually very elementary and adapted to the lay mind. In this book this material occupies only eighteen pages, the remainder of the book is given over to diets. These appear to be more simple than most of the diet lists offered in manuals of this type; and are less stereotyped and monotonous. They cannot help but be of service to the general practitioner in the planning of special diet programs.

Normal Facts in Diagnosis. By M. Coleman Harris, M.D., Lecturer on Physical Diagnosis, New York Homeopathic Medical College and Flower Hospital, New York; and Benjamin Finesilver, M.D., Lecturer on Diseases of the Nervous System, New York Homeopathic Medical College and Flower Hospital. 247 pages, 42 engravings, some in colors. F. A. Davis Company, Philadelphia, 1930. Price in cloth, $2.50.

This volume has arisen out of the experiences and subsequent convictions of the authors, who believe that no discernment of pathologic signs can be made without a thorough knowledge of the normal. In the usual teaching of Physical Diagnosis pathologic facts are so intermingled with the normal that it is difficult, if not impossible, for the student to differentiate the normal findings. Even the average practitioner is usually inclined to lay stress on abnormal findings, and to lose sight of those signs which occur in the normal individual. There are nine chapters which consider the normal temperature, pulse, respiration, height, weight, to head and neck, chest, abdomen, the extremities, pelvic and rectal examinations, and the sensorimotor examination, with laboratory findings, and a final chapter on senescence. The material used in this book seems to be correct and well chosen. The chief criticism is its incompleteness. There are many important omissions. Any modern study of the normal facts in diagnosis should certainly include the description of the chief constitutions, with their anatomic and physiologic differences. There is no generic conception of the normal, a point whch this little volume does not emphasize as it should. In this respect its statements as to what is normal are too dogmatic. The inadequacy of the material is shown in the chapter on Senescence,

which comprises a bare two pages full of matter.

Physical Diagnosis. By RICHARD CABOT, M.D., Professor of Clnical Medicine in Harvard University; Formerly Chief of the West Medical Service at the Massachusetts General Hospital. Tenth Edition. Revised and enlarged, with 529 pages, six plates and 279 figures in the text. William Wood and Company, New York, 1930. Price in cloth, $5.00.

This well-known work on physical diagnosis has now reached its tenth edition, sufficient evidence of its value to the student and to the practitioner. Written with a strong individual slant, amounting in some instances to personal bias, this work is highly suggestive and stimulating to the student of medicine. It endeavors to present an account of the diagnostic methods and processes needed by competent practitioners of the present date. It differs from other books on the subject "in that it makes no attempt to describe technical processes with which the writer has no personal familiarity, and gives no space to the description of tests which he believes to be useless." The author herein sounds his declaration of independence, and bases his work upon his individual experience. "All that I have described I know by prolonged use." As he himself acknowledges, a book constructed on this basis should make obvious what its writer considers important and what unimportant, and reveal therein not only his opinions but his personal limitations as well. This book does both of these things, and the author's method is at the same time the source both of his strength and of his deficiencies. The work is consequently extremely dogmatic, even to the degree of cocksureness, but it nevertheless is a book that is of very great value, as it has proved itself to be through the years. This new edition contains important new matter relating to coronary disease, electrocardiography, cancer of the lung, "cardiac asthma," toxic hepatitis and encephalitis lethargica.

College News Notes

Dr. Harry M. Hall (Fellow), Wheeling, W. Va., addressed the Seventh Councilor District Medical Society of Pennsylvania on June 13 at Philadelphia; his title being, "Should we Lead or Follow."

Dr. Orlando H. Petty (Fellow), Philadelphia, Pa., addressed the Eleventh Councilor District Medical Society, June 12, on "Management of Some Complications of Diabetes."

Dr. Seale Harris (Fellow), Birmingham, Ala., delivered a paper on "Home Treatment of Diabetes" before the East Tennessee Medical Association at Kingsport, May 9.

Dr. James B. Herrick (Fellow), Chicago, Illinois, was awarded the Kober Medal of the Association of American Physicians at the Meeting in Atlantic City, May 6, 1930. This medal is awarded annually for notable work in preventive medicine.

On the programme of the American Association of Physicians at the Atlantic City Meeting, May 6 and 7, were Dr. J. B. Herrick (Fellow), Dr. Cyrus B. Sturgis (Fellow), Dr. A. S. Warthin (Master), Dr. Lewis A. Conner (Fellow), Dr. C. V. Weller (Fellow), and others of the College.

Dr. A. Morris Ginsberg (Fellow), Kansas City, Mo., recently contributed the following reprints of his publications to the College Library:

"Hemoptysis in Mitral Stenosis"

"Hemochromatosis" (With Paul M. Krall)

"Clinical Significance of Precordial Pain" (With Arthur C. Clasen)

"Splenomegaly" (With Arthur C. Clasen)

In the May Issue of the Journal of the Oklahoma State Medical Association, the following papers were contributed by Fellows of the College as indicated:

"Objective Findings in Heart Disease Without Failure," by Russell C. Pigford, Tulsa, Okla.

"The Laboratory As An Aid in the Diagnosis of Syphilis," by T. C. Terrell, Fort Worth, Texas

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Dr. Herman M. Baker (Fellow), Evansville, Ind., was a visitor at the College headquarters on May 26.

Dr. William Gerry Morgan (Fellow), Washington, D. C., was inducted President of the American Medical Association at its opening session in the Masonic Temple, Detroit, on June 24.

Dr. Thomas P. Murdock (Fellow), Meriden, Conn., has succeeded Dr. Robert L. Rowley, of Hartford (resigned), as Secretary of the Connecticut Medical Examining Board.

Dr. John R. Vonachen (Fellow), Peoria, addressed the Morgan County (Illinois) Medical Society at Jacksonville, May 8, on "Urologic Conditions in Infancy and Childhood."

Dr. Martin L. Stevens (Fellow), Asheville, was elected President-Elect of the Medical Society of the State of North Carolina at its meeting at Pinehurst, April 28-30. Dr. L. B. McBrayer (Fellow), Southern Pines, was re-elected Secretary. The next annual session of the Society will be held, April 20-22, 1931, at Durham.

Dr. Frederic J. Farnell (Fellow and Governor of the College for the State of Rhode Island has been appointed by Hon. Norman

S. Case, Governor of the State of Rhode Island, as Chairman of the Public Welfare Commission of that state, official representative of Rhode Island to the Tenth International Prison Congress, to be held in Prague, Czecho Slovakia, August 25-30, 1930.

Lr. Beverly R. Tucker (Fellow), Richmond, Va., has presented an autographed copy of his late book, "The Gift of Genius," to the Library of the American College of Physicians.

Dr. Philipp Schonwald (Fellow), Seattle, Washington, presented the following reprints of his publications to the College, recently:

"Clinical Aspects of Bronchial Asthma and Hay Fever"

"Institutional Theatment of Tuberculosis"

"Zur Behandlung der Mischinfektion bei Tuberkulose"

Dr. Hyman I. Goldstein (Associate), Camden, N.J., spent six months in postgraduate work and visiting clinics in Vienna, Prague, Budapest, Leipzig and Paris last summer and winter.

Dr. Goldstein read a paper on "Recent Advances in Diagnosis and Treatment" before the Camden County Medical Society at its May meeting. He also presented a paper on "Hereditary Epistaxis (Familial) with or without Hemorrhagic Multiple (Hereditary) Telangiectasia" before the State Medical Society of New Jersey at its 164th annual meetng at Atlantic City on June 13.

Dr. H. Harlow Brooks (Fellow), New York, received an Honorary Degree of Master of Science, from the University of Michigan, June 23, 1930.

Dr. Daniel N. Silverman (Fellow) was a speaker at the first joint meeting of the Fifth District Medical Society, Louisiana, and Tri-County Medical Society, Vicksburg, Miss. His subject was "Experiences with the Peptic Ulcer Problem."

Dr. George R. Mlnot (Fellow) and Dr. William P. Murphy, of Boston, were awarded the Cameron Prize of the University of Edinburgh, Edinburgh, Scotland, in recognition of their work concerning the beneficial effect of liver therapy for patients with pernicious anemia.

On May 8, 1930, Dr. Minot was awarded in New York City, the gold medal of the National Institute of Social Sciences.

Dr. Soma Weiss (Fellow), Boston, is on leave of absence to make a survey of numerous medical clinics in central Europe.

Dr. H. L. Ulrich (Fellow), Minneapolis, used as his title "Report of three cases of Coarctation of the Aorta" in his Presidential address before the Minnesota Pathological Society at the University of Minnesota Medical School, Institute of Anatomy, on May 20.

Dr. John E. Legge (Fellow), Baltimore, delivered an address on "A Useful Sign in the Diagnosis of Ureteral Stricture and Its Sequelae" at the meeting of the Grant-Hardy-Hampshire-Mineral Medical Society at Piedmont, W.Va., on April 19.

Dr. John M. McCants (Fellow), Lieutenant-Commander, M.C., U.S.N., has been transferred from the U. S. S. Relief at San Francisco to the U. S. Naval Medical School at Washington, D. C., where he will teach and have charge of the Bacteriological Laboratory.

Drs. Joseph C. Doane (Fellow) and Henry B. Wilmer (Fellow), Philadelphia, were elected Directors of the Philadelphia County Medical Society at its business meeting on May 21.

Dr. S. Calvin Smith (Fellow), Philadelphia, was elected Vice President.

Dr. Herbert Bryans (Associate), Pensacola, Florida, was Chairman of the Entertainment Committee for the 57th annual meeting of the Florida Medical Association held at Pensacola during early May.

Dr. George Blumer (Fellow), of the Yale University Medical School, made rounds and gave clnics at the Penobscot County Medical Society at Bangor, Maine, May 19-20.

Dr. Abraham E. Jaffin (Fellow), Jersey City, N.J., during 1929 was appointed Attending Physician to Christ Hospital; Chief Attending Physician to the Hudson County Tuberculosis Clinics; Official Delegate from the National Tuberculosis Association to the International Union Against Tuberculosis meeting at Oslo, August 13-15, 1930. Dr. Jaffin will spend some time doing postgraduate work in cardiology and tuberculosis at Vienna during his trip abroad.

Dr. Henry I. Klopp (Fellow), Allentown, Pa., spoke on "The Development of a Children's Institution for Mental Health," at the meeting of the Philadelphia Psychiatric Society on May 16, at Philadelphia College of Physicians.

Dr. Carl V. Vischer (Fellow), Philadelphia, is co-outhor of an article, "The Use of Mono-Iodo-Cinchopen in the Treatment of Chronic Arthritis." This is a report of the "Arthritis Conference" of Hahnemann Hospital and was the contributed article in the May issue of the Hahnemannian Monthly.

Dr. W. D. Sansum (Fellow), Santa Barbara, Calif., Director, Potter Metabolic Clinic, Santa Barbara Cottage Hospital, is author of "The Normal Diet," a simple statement of the fundamental principles of diet for the mutual use of physicians and patients. This is the third revised edition of ths successful book.

Dr. J. M. McCants (Fellow), Lieutenant Commander, M.C., U.S.N., assumed charge of the bacteriological and serological laboratories of the U. S. Naval Medical School at Washington, D. C., on May 16, 1930. He also became instructor in bacteriology and serology at the Naval Medical School.

Dr. R. R. Gasser (Fellow), Lieutenant Commander, M.C., U.S.N., has been detached from duty at the Naval Medical School, Washington, D. C., and assigned to duty as Medical Officer of the U. S. S. Northampton. The U. S. S. Northampton is one of the largest 10,000 ton cruisers of the U. S. Navy.

Among members of the Special Committee of Private Practitioners, who are also members of the Committee on the Costs of Medical Care, are the following:

Dr. Stewart R. Roberts (Fellow), Chairman, Atlanta, Ga.

Dr. A. C. Christie (Fellow), Washington, D. C.

Dr. Arthur C. Morgan (Fellow), Philadelphia, Pa.

As Chairman of the Committee, Dr. Roberts has recently distrbuted a report on "The Scope and Aim of the Committee on the Cost of Medical Care."

Dr. Harold L. Barnes (Fellow), Brooklyn, N. Y., is the author of a paper on "Soft Curd Certified Milk" in the May Issue of the Long Island Medical Journal.

Dr. Horace W. Soper (Fellow), St. Louis, Mo., is the author of a paper on "Diathermy of the Rectum and Pelvic Colon" in the June Issue of the Journal of the Missouri State Medical Association."

Dr. W. McKim Marriott (Fellow), St. Louis, Mo., Dean of Washington University School of Medicine, was a speaker at the 65th annual convention of the Missouri State Dental Association at St. Louis, May 19-22.

Dr. Lewis A. Conner (Fellow), New York, N. Y., Professor of Medicine, Cornell University Medical College, used as his subject "The Place of Laboratory Aids in the Practice of Medicine and Surgery" in an address on May 20 before the St. Louis Medical Society.

Dr. Conner is one of the founders and first president of the American Heart Association, and Editor of the American Heart Journal.

Dr. Morgan Smith (Fellow), Little Rock, Ark., has been elected a member of the Pulaski County Board of Education.

Under the Presidency of Dr. William A. White (Fellow), Washington, D.C., the International Congress on Mental Hygiene held its meeting there, May 5-10.

Dr. Carl V. Vischer (Fellow), Philadelphia, Pa., is the author of an article, "Management of Pulmonary Hemorrhage in Tuberculosis," which appeared in the May number of the Hahnemannian Monthly.

Dr. Paul D. White (Fellow), Boston, Mass., is author of an article entitled "The Prevention of Heart Disease," appearing in the June Issue of the Virginia Medical Monthly.

Dr. Frank N. Allan (Fellow), Rochester, Minn., addressed the New Mexico Medical Society's annual meeting, June 4-6, on "Treatment of Diabetes."

Dr. Kenneth M. Lynch (Fellow), Charleston, S. C., was elected President of the South Carolina State Medical Association during its annual meeting held at Florence, S. C., recently.

Dr. Chester W. Waggoner (Fellow), Toledo, Ohio, was installed as President of the Ohio State Medical Association at Columbus on May 15.

Dr. Edgar A. Hines (Fellow), Seneca, S. C., has been re-elected Secretary of the South Carolina Medical Association.

Dr. James H. Means (Fellow), Boston, Mass., has been re-elected Secretary of the Association of American Physicians.

Dr. Cyrus C. Sturgis (Fellow), Ann Arbor, Mich., has been re-elected Secretary of the American Society for Clinical Investigation.

Dr. Charles G. Lucas (Fellow), Louisville, Ky., has been re-elected Secretary of the American Gastro-Enterological Association.

Dr. Allen H. Bunce (Fellow), Atlanta, Ga., has been re-elected Secretary of the Medical Association of Georgia.

Dr. George Morris Piersol (Fellow and Secretary-General of the College), Philadelphia, Pa., was installed as President of the American Climatological and Clinical Association, at Quebec, Canada, May 13.

Dr. Felix J. Underwood (Fellow), Jackson, Miss., and Dr. George W. McCoy (Fellow), Washington, D. C., addressed the joint session of the State and Provincial Health Authorities of North America and the State and Territorial Health Officers of the United State Public Health Service at Washington, D. C., June 18-20, on the subjects, "County Health Work Appraisal on Basis of Morbidity and Mortality" and "Antirabic Paralysis: Consideration of Various Vaccines," respectively.

Dr. James B. Herrick (Fellow), Chicago, Ill., was among those giving special clinics to Rush Medical College Alumni during the Commencement Week of the Chicago University.

Dr. Walter C. Alvarez (Fellow), Rochester, Minn., and Dr. Clarence R. Strickland (Fellow), Indianapolis, Ind., were among the speakers at the Ninth District Medical Society's meeting at Noblesville, Ind., on May 15.

Dr. Ray M. Balyeat (Fellow), Oklahoma City, Okla., addressed the Bourbon (Kansas) County Medical Society, April 29, on "Allergy."

Dr. Aaron E. Parsonnet (Fellow), Newark, N. J., addressed the Middlesex County Medical Society, April 16, on "Coronary Thrombosis."

Dr. Carl J. Wiggers (Fellow), Cleveland, Ohio, will deliver the Beaumont lecture at the Physicians Hospital of Plattsburg, N. Y., August 22-2; Dr. Wiggers' title being, "Physiologic Meaning of Common Clinical Signs and Symptoms in Cardiovascular Disease."

Dr. William E. Robertson (Fellow), Philadelphia, Pa., and Dr. Edward C. Reifenstein (Fellow), Syracuse, N. Y., will also deliver papers during the sessions.

Dr. David Marine (Fellow), New York, N. Y., recently addressed the New York

Physicians' Association on "Pathologic Physiology of Graves' Disease."

Dr. Henry T. Smith (Fellow), McGehee, Ark., addressed the Desha County Medical Society, April 22, on "X-Ray Findings in Negro School Children."

Dr. William Gerry Morgan (Fellow), Washington, D. C., President o fthe American Medical Association, received the degree of Doctor of Laws from the Georgetown University, and the degree of Doctor of Science from Dartmouth College, during June.

Dr. Allen H. Bunce (Fellow), Atlanta, Ga., addressed the Fourth District Medical Society of Georgia, recently, on "Carcinoma of the Colon."

Dr. Henry C. Sauls (Fellow), Atlanta, Ga., delivered an address on "Heart Disease" before the Spalding County (Ga.) Medical Society on April 16.

Dr. Sidney A. Portis (Fellow), Chicago, Ill., Professor of Medicine at the Loyola University School of Medicine, conducted a medical clinic at St. Mary's Hospital at Quincy, Ill., May 12, in connection with the meeting of the Adams County Medical Society.

Dr. Estes Nichols (Fellow), Portland, Maine, delivered a paper on "Treatment of Tuberculosis" before the Kennebec County Medical Association of Maine at Gardiner on April 22.

Dr. John E. Greiwe (Fellow), Cincinnati, Ohio, addressed the Highland County and Five County Medical Societies, recently, on "Hypertension with Some Newer Phases of the Circulation."

Dr. Harry M. Hall (Fellow), Wheeling, W. Va., delivered a paper recently before the Licking County (Ohio) Medical Society on "Specialism."

Dr. Laurence Selling (Fellow), Portland, Oregon, is Vice President of the Portland Child Guidance Clinic Association, recently incorporated.

Dr. Daniel J. McCarthy (Fellow), Philadelphia, Pa., read a paper, May 8, at Johnstown, before the Cambria County Medical Society on "Arteriosclerosis and Its Effects on the Central Nervous System."

Dr. Henry K. Mohler (Fellow), Philadelphia, Pa., spoke on "Diabetes Mellitus," May 7, before the Montgomery County (Pa.) Medical Society.

Dr. Martin L. Bonar (Fellow), Morgantown, W. Va., addressed the Monongahelia County Medical Society, May 6, on "Traetment of Skin Diseases."

Dr. John H. Musser (Fellow), Professor of Medicine at Tul ane University of Louisiana School of Medicine, delivered a course of lectures and clinics in connection with an extensive graduate medical course in Internal Medicine during the latter part of June and July at Beaven Dam, Beloit, Fond Du Lac, Jamesville, Madison and Watertown. This course is offered under the auspices of the University of Wisconsin Extension Division.

Dr. Julius Friedenwald (Fellow), Baltimore, Md., is one of the trustees of the Institute for Advanced Study, which is to be established at Newark, N. J., for graduate work in scientific research. "It will train advanced students for and beyond the degrees of Doctor of Philosophy or other professional degrees of equal standing." It has been reported that Louis Bamberger, Newark, N. J., and his sister, Mrs. Felix Fuld, have contributed a fund of $5,000,000 for the new foundation. Dr. Abraham Flexner, who was formerly the Director of the Division of Medical Education of the General Education Board, is said to have accepted the Directorship of the new Institute.

Among Fellows of the College who visited the Executive Offices of the College, during June, were:

Dr. Verne Caviness, Raleigh, N. C.
Dr. Julius Comroe, York, Pa.
Dr. Homer Donald, Dallas, Texas
Dr. Alvin Siegel, Philadelphia, Pa.

Dr. George E. Pfahler (Fellow), Philadelphia, discussed cancer of the uterus during the program of a cancer course held at Harrisburg, June 4, under the auspices of the Dauphin County Medical Society.

Dr. Jesse L. Lenker (Fellow), Harrisburg, was a speaker at the symposium on thyroid diseases held before the Dauphin County Medical Society, recently.

Under the Presidency of Dr. Ellen C. Potter (Fellow), Trenton, N. J., the Medical Women's National Association held its annual meeting at Detroit, June 22-24.

Dr. J. W. Torbett of Marlin, Texas (Fellow), read an article on "The Classification, Diagnosis and Treatment of Arthritis" at the trecent meeting of the Texas State Medical Association at Mineral Wells. He also received the degree of LL.D. at Southern Methodist University at Dallas on the 3rd of June at their regular annual commencement exercises.

Dr. W. Stanley Curtis (Fellow) delivered an address on "The Treatment of Diabetes" at the meeting of the Dallas Southern Clinical Society, held in Dallas on April 14.

Dr. W. B. Yegge (Fellow) discussed the subject of "Post-operative Pneumonia versus Atelectasis," from the internist's point of view, at the meeting of the Northeast Colorado Medical Society, at Sterling, Colorado, May 7.

The Dallas Southern Clinical Society held its five day conference at Dalas, April 14-18, with a registration exceeding one thousand. Doctors Logan Clendening, Kansas City, Mo.; Francis M. Pottenger, Monrovia; Cyrus C. Sturgis, Ann Arbor; and Alexander B. Moore, Rochester, Minn., were among the guest speakers.

Dr. Gilbert E. Brereton (Fellow), Dallas, was elected Secretary.

Dr. James Allison Hodges (Fellow), Richmond, addressed the Mecklenburg County (Virginia) Medical Society, April 15, on "Neuropsychic Cases."

Dr. Karl E. Kassowitz (Fellow), Milwaukee, has been made Associate Professor of Clinical Medicine at the Marquette University, School of Medicine.

Dr. John E. Gonce, Jr. (Fellow) and Dr. Ray C. Blankinship (Fellow), both of Madison, participated in a symposium on jaundice before the Dane County (Wisconsin) Medical Society at Madison, April 15.

Dr. Merle Q. Howard (Fellow), Wauwatosa, addressed the Milwaukee Academy of Medicine and the Milwaukee Neuro-Psychiatric Society on Pellagra, May 13.

Dr. William R. Bathurst (Fellow), Little Rock, was re-elected Secretary of the Arkansas Medical Society at its meeting at Fort Smith, May 6-8.

Dr. William Henry Robey (Fellow) and Dr. Samuel A. Levine (Fellow), both of Boston, have been made Clinical Professor of Medicine and Assistant Professor of Medicine, respectively, at Harvard Medical School, their appointments to date from September 1.

Dr. Colonel B. Burr (Fellow), Flint, Mich., has written the first volume of a two volume Medical History of Michigan, which was distributed on May 15.

Dr. Albert A. Getman (Fellow), Syracuse, N. Y., has become a Life Member of the American College of Physicians through subscription to the Life Membership Fund. The Endowment Fund of the College, which thus far has been made up wholly of Life Membership subscriptions, becomes a permanent trust fund of the College, the principal of which must be held intact, while the income only may be used. The Board of Regents has rather adopted the policy that the Endowment Fund shall furnish the source for the promotion of research and writing in the field of Internal Medicine, as well as for other worthy activities the College may find desirable to encourage. The John Phillips Memorial Prize, announced elsewhere in the ANNALS OF INTERNAL MEDICINE, was established from income from the Endowment Fund.

Dr. Carl V. Vischer (Fellow), Philadelphia, Pa., has contributed the following publications to the Library of the American College of Physicians:

"The Use of Mono-Iodo-Cinchophen in the Treatment of Chronic Arthritis"

"Management of Pulmonary Hemorrhage in Tuberculosis"

Dr. Beverley R. Tucker (Fellow), Richmond, Va., has contributed a copy of "The Lost Lenore," a one-act play, psychological in character, based on an incident in Edgar Allan Poe's life, to the College Library.

Dr. Tucker published during May, through the Stratford Company of Boston, a book entitled "The Gift of Genius," analyzing nineteen geniuses and giving ten chapters on genius.

Dr. W. Stanley Curtis (Fellow), Boston, Mass., presented a paper on "The Treatment of Diabetes" and conducted some hospital clinics at the Dallas Southern Clinical Society's meeting at Dallas during April.

"Health Regained!" is the tite of an interesting descriptive booklet of Devitt's Camp for the Treatment of Tuberculosis, located at Allenwood, Union County, Pa. The founder, Dr. William Devitt (Fellow), was practicing medicine in Philadelphia in 1912, when he sent two of his tuberculous patients to his farm high up in the White Deer Mountains in Central Pennsylvania in search of health. The first few patients called the place "Devitt's Camp." Today, a modern sanatorium with accommodations for 110 patients is performing every known service for people afflicted with tuberculosis. The entire institution has been built from the contributions of people interested in seeing the work progress. Devitt's Camp is not a charitable institution—each patient pays his or her way. The charges, however, are only moderate. The Sanatorium is chartered under the laws of the State of Pennsylvania, and under the charter no one can ever make a profit from its operation.

FIFTEENTH ANNUAL CLINICAL SESSION

On May 27, President Sydney R. Miller and General Chairman, Maurice C. Pincoffs held a dinner and meeting at the Baltimore Club for the purpose of organizing advanced plans for the Fifteenth Annual Clinical Session of the American College of Physicians to be held at Baltimore, March 23-27, 1931. Among those present, in addition to Doctors Miller and Pincoffs, were Dr. Winford Smith, Dr. Warfield Longcope, Dr. Lewellys F. Barker, Dr. William Wilmer, Dr. Alan Chesney, Dr. William Ford and Dr. McCollum. Many plans and ideas for the Clinical Session were presented and discussed. More definite details and specific plans will be announced in later issues.

The Lord Baltimore Hotel will be the general headquarters hotel, but the general sessions, registration, exhibits, etc., will be held in The Alcazar at Cathedral and Madison Sts. The Alcazar furnishes excellent facilities for every phase of the meeting. In fact, The Alcazar is operated more or less as a club hotel, and can accommodate approximately two hundred of our members with single or double rooms. It has an attractive dining room, where our members may secure meals before or after the daily sessions, and, therefore, should be the general headquarters for the entire session.

The Executive Secretary, E. R. Loveland, has already laid out the Exhibit, and has assigned to many of the foremost medical manufacturers and publishers over forty-five exhibit booths. Exhibits have an important part in the meeting, for members of the College and attendants at the Session have an opportunity of viewing personally the latest developments in mechanical apparatus, pharmaceutical products, special foods, laboratory and hospital equipment and medical publications. An intermission of thirty minutes, for the specific purpose of inspecting exhibits, will be arranged in the program of each daily general session.

The time of the Session, March 23-27, and the favorable climate of Baltimore should induce a much larger attendance than the mid-winter session held during the past year. While one can keep abreast of medical developments fairly well by reading the current literature, this is not a substitute for attendance at these important national meetings of the College, for one benefits most through personal contacts and actual presence at the sessions.